



**EDITORIAL**

Editor E.L. Drake Lundell Jr.  
 Managing Editor Thomas Geyer  
 Associate Editor/ Technical News Ronald A. Frank  
 Hardware Editor Victor J. Farmer  
 Software Editor Donald Leavitt  
 Assistant Editor/ Computer Industry Staff Writers Nancy French  
 Pauline F. Ward  
 Tom Woods  
 Judith Kramer  
 Cheryl M. Gold  
 John P. Hobert  
 Editorial Assistants Catherine Arnst  
 Ann Dooley  
 Marvin Smallreiser  
 J.H. Bonnett  
 Hidekatsu Sasaki  
 J. Daniel Couger  
 Alan Taylor  
 Edward J. Bride

**SALES**

Vice-President/ Marketing T. Neal Wilder  
 Sales Administrator Dorothy Davis  
 Traffic Manager Judy Milford  
 Classified Advertising Sara Sternis  
 Market Research Kathryn V. Dinneen

**CIRCULATION**

Vice-President/ Circulation Margaret Phelan  
 Assistant Manager Barbara Jeannetti

**PRODUCTION**

Manager Leete Doty  
 Supervisor Henry Flinn

Please address all correspondence to the appropriate department at 797 Washington Street, Newton, Mass. 02160. Phone: (617) 965-5800.

OTHER EDITORIAL OFFICES: Los Angeles: 963 N. Figueroa Drive, Los Angeles, Calif. 90028; Phone: (213) 488-6008. Europe: Computerworld, c/o IDC Europa, Ltd., 100 Newgate Street, London EC1A 9PT, England. Phone: (01) 485-2449. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-12, Minami-Aoyama, Minato-Ku, Shinjuku-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid in Boston, Mass., and additional mailing offices. Published weekly except a single combined issue for the first week in December by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1974 by Computerworld, Inc., all rights reserved.

50 cents a copy, \$1.2 a year in the U.S.; \$2.00 per year for Canada and PUAS; all other foreign subscriptions \$3.00 per year. No extra charge for change of address.

Reproduction of material appearing in Computerworld is strictly forbidden without written permission. Send all requests to Walter Boyd.

Computerworld can be purchased on 5-year subscription in half-volumes (one-month periods) through University Microfilms, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700.

**CENTERWORLD, INC.**  
 President/Publisher Patrick J. McGovern  
 Executive Vice-President W. Walter Boyd  
 Vice-Presidents Edward J. Bride  
 Margaret Phelan  
 T. Neal Wilder  
 Editorial Director Dr. H.R.J. Grosch



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Massachusetts 02160.

# Much Debate Expected on Privacy Bills

(Continued from Page 1)

feel strongly about the issue are expected to restore Social Security Number limitations when the bills are taken up in each house.

## Protection Commission

The Senate bill provides for a five-member, nonregulatory privacy protection commission, established for three years.

The commission is basically a "watch group" and has "no force of law" over agencies, a Senate Government Operations Committee staff member explained. The House makes no provision for such a board or committee in its bill.

While requiring state police files, the Senate bill exempts from the legislation law enforcement intelligence and investigative information.

Arrest records, however, held with manually filed fingerprints by the Federal Bureau of Investigation, are covered by the Senate bill.

A House spokesman explained that since the House Judiciary Committee is working on a bill dealing exclusively with access to criminal justice records for introduction in January, that issue was not addressed in this more general legislation.

With regard to the Social Security Number, the amendment expected in both houses will make it use as an identifier unlawful in data files established after 1975.

The amendment expected in the Senate also includes some provisions that would protect from discrimination the person who refuses to provide his number to a bank or insurance company, for example, as well as to a federal agency.

Another amendment proposed to spur considerable debate in the House is a proposal by Rep. John Erlenborn (R-Ill.) that would allow agencies to keep confidential from the subject any information obtained in the course of investigating claims for federal employment, security clearance, military service and federal contracts.

Civil service examinations would also be included in this category of exempt files.

The House bill restricts disclosure of personal information to any other person or agency with the following exception: officers or employees within that agency with a "need-to-know"; routine use as published by the agency in the Federal Register, Bureau of the Census for statistical purposes; statistical use (only if in unidentifiable form); disclosure to the National Archives; law enforcement agencies; emergencies where the health or safety of an individual is in danger; and congressional committees.

A record of disclosures outside the agency must be maintained and this record, too, is open to scrutiny unless the agency is a law enforcement agency.

The House bill describes a citizen's right of access to records:

- Individuals can see any records an agency has on him.

- Individuals can ask for their records to be changed, and the agency must comply or allow an appeal.

- In the case of dispute arising out of the records, the individual may file a statement that becomes part of the record and, on disclosure, the statement must also be disclosed.

- When a record is corrected, the agency must inform any other agency who has received that record in the past two years.

- Upon enactment of the privacy law, the House bill provides that each agency pub-

## Mass. Issues Order on Fair Practices

BOSTON — Interest in the right of privacy on the state level has culminated in a Fair Information Practices Executive Order issued by Massachusetts Gov. Francis W. Sargent, effective Jan. 8, 1975.

Directing all state agencies — other than criminal justice agencies — that collect and use personal information about the citizens of Massachusetts, Sargent's order says each person requested by an agency to supply personal data not for statistical purposes has the following rights:

- Knowledge of the information's intended use.

- Knowledge as to whether he is legally required to supply such data and under what circumstances which may affect his final refusal.

- In addition, she shall be permitted, upon request to any agency, an opportunity to view information held by that agency unless doing so would be contrary to statute.

- It guarantees the accuracy, completeness or mode of maintenance or dissemination of any personal data about him maintained by that agency, and if any correction or addition to the contents is not made within 30 days, the agency shall add a statement that may be maintained and disseminated with the original record.

- Data collection by state agencies must conform to the following principles:

### computers.

A record of disclosures outside the agency must be maintained and this record, too, is open to scrutiny unless the agency is a law enforcement agency.

The House bill describes a citizen's right of access to records:

- Individuals can see any records an agency has on him.

- Individuals can ask for their records to be changed, and the agency must comply or allow an appeal.

- In the case of dispute arising out of the records, the individual may file a statement that becomes part of the record and, on disclosure, the statement must also be disclosed.

- When a record is corrected, the agency must inform any other agency who has received that record in the past two years.

- Upon enactment of the privacy law, the House bill provides that each agency pub-

- No agency shall collect personal data other than that necessary to perform its lawfully authorized functions.

- Each agency shall designate one officer responsible for such data systems.

- No agency shall use personal data collected for one purpose for another unrelated purpose without the consent or knowledge of the data subject.

- Each agency shall assure that agencies who receive such information are aware of the nature of the data and this executive order must be observed in handling personal information.

- An agency may computerize personal data only after identifying all reasonably foreseeable threats to the security of such data by computerization and take steps to minimize such threats.

- Within 90 days after the effective date of this order, the Secretary of Administration shall adopt regulations to implement the provisions and purpose of this order, providing for methods of administrative appeal if injured citizens.

The Executive Order is an official expression of the state's policy regarding privacy rights of its citizens, for guidance of state officers who must carry out the order.

In the case where a statute exists, it is subordinate to and cannot affect the scope of that statute. It has the force of law until legislation is enacted.

## DEC PDP-11 Cobol Uses 1974 Standard, Paging

(Continued from Page 1)

is not.

Multiple programs can be run concurrently, which requires support for the object (unit record) file, assembly and coding specific to the user's program, including Data Division, I/O buffers, Procedure Division literals (about 2-1/2K words) and the mandatory three-page area for the program logic.

DEC's Cobol does not include support for the new standard's Communications module nor does it support the Communications module nor does it support the

CALL/CANCEL facility. The system does not have an imbedded SORT verb or backing for indexed sequential I/O like IBM's ISAM.

Limited support in the underlying RSX-1D operating system prevents users of the new Cobol system from working with multiple volume magnetic tape files, DEC admitted.

The new language system is an outgrowth of work performed to support DEC's purchase some time ago from Computer Power Australia [CW, March 27]. When

## Ansi Standard Available

NEW YORK — The new Cobol standard has finally been published and is now available from the American National Standards Institute (Ansi). And so the phrase "ANS Cobol" should now be used only for those compilers that meet the 1974 specifications.

Technically, systems that meet only the 1968 standard are no longer "ANS Cobol," an Ansi source noted.

Ansi completed its formal approval

of the 1974 standard last May but final editing and production problems prevented its release until now, a member of the X3/34 committee responsible for the standard explained.

"Technically, it's a long, the software is 8-1/2 in. by 11 in. thick, punched, punched costs \$12 and can be ordered under its formal designation, Programming Languages: Cobol, X3.23-1974," from Ansi, 1430 Broadway, 10018.

DEC acquired the system, however, it was geared to the old Cobol standard and to DEC's earlier DOS environment. The work needed to get the system up to the 1974 specification is the most difficult aspect of the transition, said here in the U.S. "almost completely," DEC said.

The system has been out since June in seven user sites with a range of application interests. Though bugs have been found, they have been corrected, the source said. They have been "satisfied" with both the programming and the documentation, DEC said.

The PDP-11 Cobol system will be available for general distribution at the end of that month in two versions, with or without memory, costing \$4,300. The fully supported package has a \$7,000 price tag. Support after the first year can be continued for \$1,000 annually. Enhancements to the system will be separately priced, DEC noted.

The basic version, without support or memory, costs \$4,300. The fully supported package has a \$7,000 price tag. Support after the first year can be continued for \$1,000 annually. Enhancements to the system will be separately priced, DEC noted.

# CHAMP

## Introducing new SyncSort III:

### The fastest sort of 'em all!

(Seconded by the finest sort service.)

**Call (201) 947-8500**

Ask about our free  
six-step sorting survey:

1. Technical presentation  
in your office.
2. Sort-load analysis.
3. Test outline.
4. On-site demonstration.
5. Tabulation of results.
6. 30-day trial period.

SyncSort III is a breakthrough in sorting technique.

The fastest, most comprehensive sort available. Its new VIRTUAL-SORT technique has been applied not only to all VS systems but to OS and DOS, too.

Efficiency differences between fixed and variable-length sorting have "virtually" been eliminated. You can even sort records greater than track size.

And SyncSort III is backed by the best support service anywhere. (Rated 4.0 — top grade — in a recent survey. Details on request.)

When you call our man Harvey, say, or one of his teammates, you are talking to somebody who really knows the sorting territory. (After all, he helped make the map!)

SyncSort III will cut your IBM timings dramatically. But it's more than just a speed package. Because it makes things a lot easier for a lot of people. By taking some of the blood, sweat, toil and tears out of sorting.

HERE's WHAT SyncSort III CAN MEAN TO YOU:

**1. Fewer operations problems.** (No JCL change.)

- Up to 50% more records in a given disk space.
- Release of excess disk space.
- Secondary allocation.
- Non-contiguous work space.
- Direct communication with an invoked sort.

**2. A tool for managers and analysts.**

- Sort-load profile goes to the manager each month.
- Exception reports to pinpoint inefficient sorts.
- Sets and maintains standards for sort users.
- Structures systems and selects optimum environments.

**3. Unmatched performance on fixed and  
variable-length records.**

- 30% average time savings on sorts in "OS".
- Dramatic time savings in "VS" (no need to run V-R).
- Significant background savings.
- Marked reduction in I/O accesses and CPU time.
- Reduced CCW overhead through EXCP-VR (VS only).

The OS/VS versions of SyncSort III are ready to go. The DOS and DOS/VS versions will be available late in '74.

Call (201) 947-8500 or write us today. We'll visit your operation and do a professional sorting survey (through SMF analysis), and show you what SyncSort III can do for you in the crunch. There's no cost or obligation. Example sent on request.

*Helping people sort out their problems is our business.*



**WHITLOW**

**COMPUTER SYSTEMS Inc.** 222 S. Marginal Road, Fort Lee, New Jersey 07024

## Davis Warns of New Dimensions

By Edith Holmes  
Of the CW Staff

**WASHINGTON, D.C.** — "The privacy problem has spotlighted our inadequacies in dealing with technologies that directly or indirectly affect individual rights or desires," Ruth M. Davis, director of the Institute for Computer Sciences and Technology within the National Bureau of Standards (NBS) told a meeting of the Computer Law Association, Inc. here recently.

In her effort to place the problem in perspective, Davis commented privacy has become urgent because "it is not an isolated issue, but a harbinger of 'things to come.'"

As our service economy becomes more dependent upon automated information systems, and as individuals place increasing emphasis on their individual rights, privacy will serve to illustrate the clash of interests between individual rights and technological necessity, she said.

She charged neither the legal nor the technical communities have indicated they are particularly able to predict or handle these conflicts of interest.

"More importantly," she added, "the privacy problem has now assumed such proportions that it can no longer be resolved by these two communities,

either acting separately or collectively."

### New Dimensions

The problem has acquired economic, regulatory, political, domestic and international dimensions, said Davis.

Technological and legal elements,

Davis noted. And "the ability to separate the privacy problem into resolvable components keeps decreasing as the dimensions of the problem keep increasing."

In defining the scope of her talk, Davis focused on the computer privacy problem: management via automated information systems with emphasis on computers and related equipment and data terminals. She also concentrated on those information management practices controlling the collection, processing, correction, storage, dissemination and reviewing of data.

Assessing the problem within this framework, Davis identified several "major technology problem areas" which act as barriers to the resolution of the privacy issue.

Many of the technologies devised to protect information contained in automated systems haven't been resolved technically but need solution if the intent of the current congressional bills on privacy is to be met, she noted.

Davis also remarked these technologies haven't been defined sufficiently for R&D cost estimates to be credible or for marketplace costs of their implementation to be predictable.

More significantly, she stressed the importance of resolving such technological issues as the use of "universal" individual identifying numbers; the means of unique individual identification for access of information by remote terminals; the means of controlling access to automated information systems; the means of purging, sealing, deleting and correcting files containing personal information; procedures for maintaining records of access to files; and measures of the adequacy of security effectiveness.

### Traditional Disputes'

"The traditional disputes shown by each of the communities of specialists who must work together if these technical, legal and economic problems are to be solved simply aggravate this situation," Davis said.

"We need a sympathetic tolerance of each other's jargon and a willingness to recognize the importance of each specialty in dealing with the overall problem of privacy," she cautioned.

She noted a half dozen recent instances



CW Photos by E. Holmes Davis

of cooperation between the technical and legal professions, including:

- The National Academy of Sciences, Russell Sage Foundation-sponsored project drew together legal and technical expertise and culminated in the 1972 publication of *Databanks in a Free Society*.
- The Roscoe Pound-American Trial Lawyers Foundation's Annual Chief Justice's Conference at the Warren Conference of 1974 which brought technologists and lawyers together to discuss "Privacy in a Free Society."

• Judge John J. Sirica's use of a panel of acoustic and electronic recording experts in analyzing the Watergate tapes.

The Forum on Privacy, a joint committee by the American Bar Association and the American Association of the Advancement of Science.

• The use of the Federal Trade Commission makes of its technologists, economists and lawyers in handling its regulatory function under the Fair Credit Reporting Act of 1971.

• The 1973 and 1974 NBS-sponsored "Privacy and Security" conferences which brought together state and national congressional, economic and civil liberties, industry representatives and technologists to discuss the need for government action in the privacy area.

While Davis considers these attempts at collaboration encouraging, she contended such cooperation alone will not solve the privacy problem.

"Privacy is nice if you don't have to pay for it," she said. Individual citizens, professionals and governments must decide whether they really want privacy.

"Technologists have a responsibility to provide privacy options in a variety of products and costs," she concluded.

## DP Abuse May Prove Attractive to Underworld

**WASHINGTON, D.C.** — As privacy is used as force to become more separated and secure, the increasing value of such information could make computer abuse more attractive to organized crime, a lawyer with a background in computers told attendees of a Computer Law Association meeting here recently.

A member of MacLeod, Fuller, Muir & Godwin in Palo Alto, Calif., and principal investigator of a study at the Stanford Research Institute's National Science Foundation-sponsored computer abuse project, Susan Nyman noted the participation of the underworld would alter the portrait of the average perpetrator of computer crimes.

"Normally, these people are men between 18 and the mid-30s in age and are very bright and highly motivated," she said.

"Often programmers, computer criminals see the crime as a challenge to their

intelligence and ability." While she described them as having a "Robin Hood complex," Nyman added "they seldom give what they steal to the poor."

In general, the computer abuser has never been in trouble before, and half of them use an accomplice. "This represents a departure from most white collar crime, only 4% of which is perpetrated with accomplices," she remarked.

### Other Types of Crime

While privacy will affect the value of information contained in automated systems, which will include these crimes from a criminal point of view, Nyman said crimes involving privacy only constitute one category of computer abuse.

"Privacy issues are only involved in acts against assets, not in acts in the computer," she commented. "Crimes can also be committed against the system or the hardware itself, against others by using the computer as the crime tool and against computers as a symbol of something hated."

Crimes against computer assets and, potentially, against privacy involve alter-

tions or theft of the system's input, programs or output.

Nyman noted the justified refusal of two psychiatrists in California to include the names of their patients in a state data bank on mental illness, the actions of a programmer accused of bigotry in writing programs which excluded blacks from consideration for hiring, and the unauthorized use of mail lists designed for election purposes in sending out junk mail as examples of privacy violations in each of these areas.

In a forecast of future computer crimes, she predicted that computer privacy will become the focus and not the by-product of some computer abuse, particularly if perpetrated by organized crime.

Hypothesizing that in the long run, the incidence of financial and information crimes will go down because of the automation of most business, she predicted security of the processing and storage of information and the existence of fewer potential perpetrators. Nyman predicted the losses per incident will go up because of the higher costs and dangers to perpetrators and the exposure of greater informational assets.

ATTACH A MAIL CARD FOR ADDITIONAL INFORMATION. THE CODE IN YOUR ADDRESS SHOWN ON THIS CARD WILL BE USED TO IDENTIFY YOUR ENVELOPE.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS. WE NEVER USE YOUR NAME OR ADDRESS.

Please send me COMPUTERWORLD for 1 year RATES: U.S. - \$12 Canada and PUAs - \$20 Other foreign - \$36

Check Enclosed       Charge My American Express Account: If charge we must have cardholder's signature:


First Initial \_\_\_\_\_ Middle Initial \_\_\_\_\_ Surname \_\_\_\_\_

October 23, 1974

Your Title \_\_\_\_\_

Company Name \_\_\_\_\_

Send to: Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Address shown is:

Check here if you do not wish to receive promotional mail from Computerworld.



COMPUTERWORLD

CIRCULATION DEPT. 797 Washington Street, Newton, Mass. 02160

### PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

#### BUSINESS/INDUSTRY

10 Manufacturer of Computer or DP Hardware/Peripherals

20 Distributor of Computer or DP Hardware/Peripherals

30 DP Service Bureau/Software/Planning/Consulting

40 Public Utility/Communication Systems/Transportation

50 Wholesale/Packaging/Manufacturing

60 Finance/Insurance/Real Estate

70 Mining/Construction/Petroleum/Refining

75 Governmental Service (except DPL)

80 Education/Healthcare/Law

85 Government - Federal/State/Local

90 Advertising/Publishing/Other Communication Service

95 Other

#### TITLE/OCCUPATION/FUNCTION

11 President/Owner/Partner/General Manager

12 Admin. Vice Pres./Vice Pres.

13 Treasurer/Controller/Finance Officer

21 Director/Manager of Operation/Planning/

Administration/Sales

22 Director/Manager of Supervisor DP

23 Systems Manager/Systems Analyst

31 Manager/Supervisor/Programmer

32 Computer Operator/Analyst

41 Application Engineer

42 Other Engineering

43 Sales Representative

52 Other Sales/Marketing

53 Consulting

70 Accountant

80 Librarian/Educator/Student

90 Other

*Progress Report:*

# 370/STOR 145

**IT'S THE THINGS  
THAT ARE DIFFERENT  
THAT MAKE THIS MEMORY  
SO SUCCESSFUL.**

370/STOR 145 is an expansion memory for IBM 3145 processors. In less than a year, it has become the dominant product in its market. Why? For one thing, security. Model 3145 users know Cambridge is the only independent supplier that designs, manufactures, sells and services the systems we install. For another, performance. 370/STOR 145 is different from any other 3145 add-on memory; and it is these differences that make it attractive. For example:



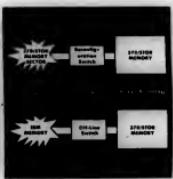
### NO FLOPPY DISK MODIFICATION

A user can add 370/STOR 145 memory, in any size increment, without tampering with the console file. No patch decks are required, ever. So what happens on your "floppy disk" is between you and IBM. Cambridge doesn't get involved.



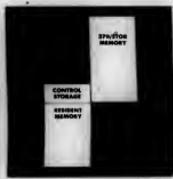
### NO CPU ALTERATION

370/STOR 145 installs directly to your 3145 processor. No wiring changes. No model changes when you expand memory beyond your current model's capacity. That means Cambridge can increase your model 3145 memory to a full two megabyte capacity without any CPU alteration.



### UNIQUE MEMORY PROTECTION

370/STOR 145 detects and corrects all single-bit errors, and detects multi-bit errors. So do other 145 memories. So to be different, we add a reconfiguration switch to let you dial out failed 370/STOR memory, plus an offline switch to dial out failed IBM memory. Either way, you keep running.



### HIGHEST MEMORY ADDRESSING

Even IBM must change address lines when you add its memory. But not Cambridge. 370/STOR 145 is directly addressable up to 2048K without any change. It floats on top of any IBM address level. That's the secret of our modular expansion, lack of CPU alteration, and freedom from console file tampering.



Cambridge Memories, Inc. 12 Crosby Drive, Bedford, Mass. 01730 (617) 271-6400

Contact our sales offices for further information: Boston (617) 271-6400 • Hartford (203) 633-8714 • Philadelphia (215) 295-1186 • Columbus, O. (614) 459-0154 • Kansas City (913) 371-3352 • Atlanta (404) 252-1382 • San Francisco (415) 692-4806 • New York City (201) 947-0184 • Rochester (716) 637-2229 • Chicago (312) 449-5260 • Detroit (313) 557-4080 • Washington, D.C. (301) 657-9015/6 • Dallas (214) 231-4804 • Los Angeles (213) 822-1166 • Charlotte, N.C. (704) 568-1787.

**CAMBRIDGE.**

A good place to put your information.

# Poor Legislation Seen Danger to Citizens, Industry

By Edith Holmes  
For CW Staff

**WASHINGTON, D.C.** — The greatest danger for private industry and citizens in the enactment of privacy laws is legislation through ignorance, an attorney warned an audience of lawyers and computer specialists at a recent conference here.

"No congressman, except someone interested in immediate retirement, would vote against privacy," commented Francis M. Gregory Jr., a lawyer with the Washington, D.C.-based firm of Sutherland, Asbill & Brennan.

## CW at CLA

"Because any bill reported in Congress is likely to be passed, laws will be enacted which lack the benefit of the experiences of private industry in the area of privacy," he added.

Addressing the meeting of Computer Law Association, Isaac A. F. Westin, professor of public law and government at Columbia University, indicated privacy legislation for the private sector would be best initiated at the local level.

Maintaining that private industry will be

federally regulated in the area of privacy sooner rather than later, Gregory said private enterprise must move early in the stages of legislation to make its views known to Congress.

Anticipating the Koch-Goldwater bill on privacy, Gregory said it was "a major issue before the House of Representatives next year." He hopes the committees involved will "take the time for businesses to come in and explain their approaches to privacy."

He noted neither the Moorhead nor the Ervin committees on the House and Senate privacy bills held one day's hearings on the activities of private industry in the area of privacy.

Given infinity, the costs of implementing automated information systems and the need of compliance with federal privacy legislation, Gregory suggested that the Sherman Antitrust and the Fair Credit Reporting Acts might adequately protect privacy in the private sector without additional legislation.

### Local Efforts

Working from the assumption that legislation aimed at insuring privacy does not need to be passed, Westin stressed the need to bring computer experts together on the state and local levels to discuss privacy issues.

He cited efforts in Wichita Falls, Texas, Charlotte, N.C. and Berkeley, Calif. to resolve these problems locally.

In Berkeley, Westin noted the city council requested agencies employing automated information systems to submit privacy impact statements to be reviewed by a variety of people in a wide range of professions. Once screened for potential violations of civil liberties, the statement



Westin

goes back to the council which holds public hearings on its content.

He argued that, if well developed locally, techniques for managing information systems in the area of privacy could be exported and adapted to other areas.

"We also have a tendency to play down privacy activity on the state level," Westin said. In 1973, 100 privacy bills were considered by state legislatures last year and 35 of these were actually adopted by various states as of Sept. 1974."

One state has attempted to define fair information practices; four have written the right to privacy into their constitutions. The state of California, which has the Social Security Number; eight have established study commissions on privacy; three have permanent recordkeeping committees; three have enacted laws regarding the handling of records in educational school records; six have laws regarding the confidentiality of arrest records; three have set up criminal justice systems; and four have created laws on credit reporting.

Westin stressed the need for some kind of privacy board "to act as a place where individuals can take complaints short of having to go to court."

While privacy bills are enacted,

Westin stressed the need for some kind of privacy board "to act as a place where individuals can take complaints short of having to go to court."

While fulfilling "what the Swedes call

"the wall function," such a board could also provide the kind of pressure for responsible action the public needs."

Federal Officials Report Progress in Privacy Area

(Continued from Page 1)

the information concerned as essential to law enforcement or national defense."

In addition, the House failed to pass a uniformity of procedure and administration of privacy regulations, Koch contended.

He said he and other members of the House plan to offer amendments to these "deficiencies" when the bill comes to the floor.

Despite the omissions he believes it contains, Koch contended the passage of this or the Senate's privacy bill will benefit the nation. "Agencies will now consider what they're collecting and, because they know individuals have the right to correct their files, agencies should be able to policing themselves in the area of privacy," he said.

Koch added that for the first time the burden of proof will be on the agency to show why a file should not be exhibited.

"There is a balance to be struck in terms of what the government needs to function and what individuals deserve in order to keep elements of their lives private," he commented. "The bills advanced in the House and the Senate attempt to achieve this balance, though they haven't reached it yet."

### Executive Viewpoint

From the point of view of the executive branch, Douglas H. Koch, deputy executive director of the House Democratic Committee on the Right of Privacy, reported the progress made on the 14 recommendations submitted to the President by the council last July.

"Unless Congress fails to enact privacy legislation before the end of this session, the President will issue an executive order designed to regulate the federal agencies in this area," Metz added.

The council has also asked the National Bureau of Standards to accelerate its research into privacy standards and to submit its report by April 1975 rather than "sometime in '76," he noted.



Metz



Koch

Urging the Federal Government to exercise leadership in establishing privacy in the marketplace, the council has sponsored the writing of a code of fair practices and hopes to obtain voluntary commitments from corporations in the retail, credit card and insurance industries, he explained.

The code should be released for review sometime after the November elections, Metz added.

The council on privacy also agreed individuals should be allowed to object to the inclusion of their names on mail lists set up by the government.

Metz added the council also agreed to propose comprehensive legislation which would make all income tax returns confidential with any exceptions to be determined by Congress and not by the President.

In addition, studies of the privacy issues involved in electronic funds transfer systems (EFTS) and in maintaining health records have been solicited from the Department of Health, Education and Welfare (HEW), he said.

### Recommendations to Congress

The council also has made a number of recommendations to Congress which directly affect the bills currently under way in both the House and the Senate. Among these are suggestions that federal agencies define the purpose and requirements of supplying data for the consumer, that privacy bills codify current Department



CW Photos by E. Holmes

of Defense regulations prohibiting surveillance of civilians, that access of law enforcement agencies to bank records be restricted and that amendments to the Fair Credit Reporting Act allow individual consumers, in addition to visual access, of records held on them.

Metz claimed the council has also initiated investigations into privacy legislation dealing with criminal justice, the maintenance of employee records by the private sector and federal employees' rights.

Finally, "in an effort to work closely with state and local interest groups to exchange views on privacy," the council will sponsor a conference in December with representative groups from state and local governments, Metz said.

He noted the President plans to ask Nelson Rockefeller to assume chairmanship of the committee if his appointment to the vice-presidency is confirmed by the Senate and that the committee will probably continue to operate on an ad hoc basis through 1977.

### Intrive Doubt

While the council has initiated much valuable thinking on privacy matters, we should invite doubt and questions of the recommendations put forth by this advisory committee," David B.H. Martin, special assistant to the secretary and director of the fair information practices section, told the audience.

While he conceded that committee hearings on privacy "deplorable," Martin conceded "perhaps broadly drafted, badly conceived, poorly drafted bills are necessary to bring the privacy issue to public attention."

Reporting on the activities of HEW, he commented the department is "participating actively to insure restrictions comparable to those of the census bureau on confidentiality for all agencies gathering statistical information."

He expects HEW will also announce its recommendations on the use of the Social Security Number shortly.

## pocket power guide

to computer technology developments

**AN AUTHORITY GUIDE FOR EXECUTIVES** Marketing Data Information about terminals— their cost and use; their characteristics— their compatibility with existing equipment and user-programmable intelligent terminals for every application from over 100 manufacturers;

**TERMINALS REVIEW** presents well organized, highly compact feature format for easy visual comparison. About 100 pages in handy pocket booklets.

Annual subscription is \$37.00. Issued three times a year.

### GML

**GML Corporation**  
594 Marlatt Road, Lexington, MA 02173  
(617) 861-0515

**Information Services for Professionals**  
SBEA, CLIP and MAIL

Send me **Terminals Review** @ \$37.00.  
 Bill me **Terminals Review Enclosed**

Name \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

# GENERAL LEDGER YOU STILL HAVE TIME!



## CATCH UP THIS YEAR

BUY NOW AND MAKE 1975 A MORE EFFECTIVE YEAR FOR YOUR COMPANY WITH THE MSA GENERAL LEDGER SYSTEM. ITS FEATURES ARE:

- EFFICIENT REPORT WRITER
- STATISTICS MANAGEMENT
- BUDGETING AND RESPONSIBILITY REPORTING
- SEQUENTIAL AND SIMULTANEOUS ALLOCATIONS
- CONSOLIDATED REPORTING
- PROJECT AND PRODUCT ACCOUNTING
- CURRENCY CONVERSION
- GRAPHICS CAPABILITY
- VARIABLE BUDGETING
- IBM 360/370; BURROUGHS
- ANS COBOL
- TOTAL, IMS COMPATIBILITY

HURRY UP AND SEND MORE INFORMATION ON:

- MSA General Ledger
- MSA General Journal
- MSA Fixed Asset Accounting
- MSA Inventory Control
- MSA Accounts Payable
- MSA Financial Information and Control System for Banks
- MSA Time Deposits
- MSA Installment Loan
- MSA Financial Reporting for Insurance Companies

Name \_\_\_\_\_  
Company Name \_\_\_\_\_  
Address \_\_\_\_\_  
City, State \_\_\_\_\_ Zip \_\_\_\_\_

Send To:  
William M. Graves, Executive Vice President  
Management Science America, Inc. 404/262 2376  
3445 Peachtree Rd., N.E., Atlanta, Georgia 30326

NEW YORK 201/671-4700 CHICAGO 312/323-5960 LOS ANGELES 213/675-6726

OL 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

MSA

MANAGEMENT SCIENCE AMERICA—  
FIRST IN FINANCIAL SOFTWARE

# DATA ENTRY EQUIPMENT

is one of the things you'll be seeing at the 1975 Computer Caravan—the traveling computer users' Forum and Exposition. And here are some of the companies who will be exhibiting products or services in this field:

Control Data Corporation  
Sycor, Inc.  
Inforex, Inc.  
Consolidated Computer, Inc.  
Datatype Corporation  
GTE Information Systems  
Beehive Terminals  
Hewlett Packard  
California Computer Products, Inc.  
Scan-Data Corporation

**Make sure you're there when The 1975 Computer Caravan comes to a city near you.**

## The Computer Caravan/75

sponsored by:

**COMPUTERWORLD**

797 Washington Street Newton, Mass. 02160  
(617) 965-5800

ATLANTA • PHILADELPHIA • MARYLAND • NEW YORK  
CLEVELAND • CHICAGO • ST. PAUL • SEATTLE • SAN FRANCISCO



**For Honeywell  
200 & 2000 Systems.**

**From FORMATION.**

Our new high-performance, automatic reading, fourth generation magnetic tape subsystem. We call it the Life Preserver because it brings new breadth to your Honeywell Series 200 or 2000 Computer System.

Enhancing it with a range of features and options you can't find anywhere else—even from Honeywell. Allowing it to continue to do everything it's been doing ... while enabling it to tackle those jobs you've always wanted to do. But couldn't until now.

Until Formation, Inc., engineered a magnetic tape subsystem that's plug-compatible with your Honeywell 200 or 2000 Computer System. Including eight Honeywell-equivalent modes, such as seven-channel (at 200, 556 or 800 bpi), and nine channel (800 bpi NRZ or 1600 bpi PE), and at speeds from 70 to 150 ips.

It's also available on the same controller, it's software-compatible with the Series 200 and 2000 systems, and it utilizes that same software to be industry-compatible with S-6000, EBCDIC, and ASCII tapes.

If you want to preserve the substantial programming investment in your Honeywell Series 200 or 2000 Computer System, if you'd like to improve performance, reliability and maintainability, and if you have some room to grow beyond all that, this magnetic tape subsystem is the Life Preserver you've been looking for.

We're Formation. And we deliver proven peripheral subsystems for RCA Spectra/Univac Series 70, RCA 3301, DEC PDP-11... and you.



## Caravan '75 Program Set to Roll With Emphasis on Implementation

*(Continued from Page 1)*  
peated, however, so more than one can be attended.

Another new feature, a wrap-up panel, will be held each evening and will serve to put all the day's problems and solutions into perspective. This is designed to promote a group examination of the day's theme and to permit the attendees to ask "that last question."

The opening day workshops will focus on computer networks, and topics specifically on configuring the data center, performance measurement, dedicated systems and small centers.

On the middle day in each city, software will be the topic of discussion. Workshops will cover data base management systems, evaluation applications, programming the small business system, utility software.

The third day's sessions will concentrate on data communications. Data transmission, network management, terminals and front-end processor will be the main areas of emphasis here.

Following the wrap-up panels will be special open sessions. In many cases these sessions, open to all caravan attendees, will be cosponsored by local chapters of national professional societies. The sessions will focus on practical system selection, virtual versus real storage and "The Human Interface: External Opportunities and Dangers for Data Communications Users."

The "recruitment" effort for the local and regional users who conduct the workshops is well under way, according to Toni Wiseman, forum coordinator.

For the eastern portion of the nine-city tour, Wiseman said management-level computer users from Southern Railway, the American Roebuck Blended Administration and Pratt & Whitney Aircraft were "typical" of the type of users who had volunteered.

The participants' roster for Atlanta, where the Caravan begins Feb. 24, is almost complete, she added.

### Established Up

This year's exhibit, with 95 booths, is already 50% larger than last year's, according to Wilder.

Software is the biggest area of implementation, he noted, with six independent software companies already signed on for the tour. Each of these firms, in

addition to having a booth on the exhibit floor, will be conducting an independent seminar on its product.

Other exhibitors will be running seminars. "Virtually every element of a system will be on display, so that the attendee will have an opportunity to look into every aspect of the system he needs from host computer to the smallest terminal, even down to a subtransactional device," Wilder said.

A sample of the exhibitors includes ICC Milgo and AT&T in the communications area; Callinane Corp., Software International, Inc., and Panoptic Systems, Inc. for software; Pacific Computer Co., Comdata Corp., California Computer Products, Inc., and Cambridge Memories, Inc. in the peripherals sector.

Large terminal companies such as Inco-term Corp., Sycor, Inc., Hazelton Corp. and Datapoint Corp. will be on hand, as will CMC, Decades, Inc., and Computer Transaction Systems for those looking at smaller terminals.

In addition to the regular touring exhibitors, 10 companies will be exhibiting on a regional basis.

The 1975 Caravan will open in Atlanta, Feb. 24. From there it will journey on to Philadelphia, Hartford, New York, Cleveland, Chicago, St. Paul, Seattle and San Francisco.

## Put Money in EFTs, Local Banks Urged

**NEW ORLEANS** — The future success of the banking industry requires immediate action, says the chairman of the development of electronic funds transfer systems (EFTS), the president of the American Bankers Association (ABA) said here recently.

"Through checks will still be used, it seems to ever bank customer and small business has access to electronic transfers and systems in order to succeed," Rex J. Mortland told the annual convention of the ABA Bank Card Division.

For instance, much of the responsibility for assuring that community banks have access to EFTS lies with community banks themselves. And the whole industry has a stake in seeing that electronic transfers do not become the exclusive domain of larger banks," he said. "The survival of smaller banks is in doubt."

Mortland told the nearly 800 bank card managers from across the country that "bank cards are the cutting edge for electronic transfer systems—the backbone of evolving technologies and payment methods."

He told them that they had a responsibility to draw the smaller banks into the evolving payments system.

"As bank card specialists, you can be the catalyst for change—the forward-thinking professionals who facilitate the community banker's partnership in EFTS."

## edp suppliers directory-\$25

**datapro**

DATAPRO RESEARCH CORPORATION  
1600 Underwood Boulevard / Darien, N.J. 07025  
(201) 764-0100

One Computer Drive  
Cherry Hill, NJ 08003  
(609) 424-1713



## Editorial

### Will We Be Forced to Accept Mandated Privacy Controls?

The Republican Task Force on Privacy believes there to be a definite need for the development of a universal code of ethics and standard of conduct for the technical, managerial and academic personnel involved in the development and use of personal information systems. The Task Force regards this to be essential for the automated and computerized information systems. [emphasis added]

The computer community is coming under close Congressional scrutiny, as this quote from a recent report of the Republican Research Committee's Task Group on Privacy indicates [CW, Oct. 2].

And the computer community's record is deplorable; even if a mandated solution to the lack of professional standards in the privacy area is enacted, its effect could precipitate a situation worse than the present.

To date there have been many half-hearted attempts to define the responsibility of the DP professional in regard to personal information held in information systems.

The ACM, DPMA, SCDP and other organizations have proposed and, in some cases, even adopted a group of high-sounding principles to govern professional attitudes and to foster a concern for privacy within the computer community.

But in almost all cases there has been little follow-through and few or weak penalties for violations of the codes of ethics suggested.

Possibly this lack of any enforcement mechanism, more clearly than any other set of circumstances, underlines the premise that DP is not a profession.

Recognized professions such as medicine and law do have enforcement mechanisms—doctors' licenses can be lifted and lawyers can be disbarred for unprofessional behavior.

DP "professionals," on the other hand, endlessly debate the meaning of the term "professional" and pass high-sounding resolutions about their responsibilities, but to this day no one has made the hard decision to enforce such regulations.

Any legislated code of ethics, however, could be worse than the present system.

Legislators are not known for an in-depth understanding of the work, aspirations and responsibility of those working with DP systems.

Any code of ethics that was legislatively determined could, therefore, cripple the people working in DP and tie their hands to specified solutions to such problems as the protection of individual privacy in computerized data banks.

Mandated regulations, while well intentioned, would be hard—if not impossible—to change and adapt to advances in technology and the techniques for managing data centers and information.

The possibility of some type of mandated code of ethics should not be tolerated, but neither can the present system be allowed to continue as is.

The computer community is at a crossroads. If it will not take the responsibility for developing and enforcing well-thought-out and comprehensive professional standards for protecting personal privacy in computerized systems, the government may well impose such standards.

If those who are fond of talking about professionalism do not take action before Congress does, they may well deserve what they get.



"... Take 2 cups sustained-high-profits, add 1/2 tbs GE-and-RCA-exit-from-market, sprinkle with 1 cup premature-hardware-announcements, fold in 3 tbs renamed-underpriced-equipment..."

## Letters to the Editor

### It May Not Be 'Practical,' But It's Been Working Well

Golly, gee! Sure shows what you get for being dumb. Now, if Martin A. Goetz hadn't told us in the Oct. 2 issue it wasn't "practical" to use structured programming techniques without a pre-processor, we would just have gone right on using them without it like we have for the past 10 months.

When our people read Goetz's article, well, you should have heard the weeping and wailing that went on! Here they were thinking that results such as the following were practical, and they didn't use any preprocessor:

- All our projects using structured programming techniques finished before or on elapsed time schedules.
- Manhours were tracked and ran well below estimate.
- Lines of code per man-day ran from 36 to 58 in Cobol programs ranging from moderately complex to highly complex.
- Test runs needed to produce a debugged program were fewer than anticipated.
- Programs produced have shown no "hidden bugs" after going into production.
- Maintenance (not please note, for errors) was not half as easy; programs worked out-of-the-box. The maintenance was not done by the people who originally wrote the program.

You know, after reading Goetz's article, one of our more suspicious-natured programmers suggested that just because he worked for Applied Data Research, and just because Applied Data Research had a good record, Goetz started his article in favor of a preprocessor.

Of course, the rest of us condemned our suspicious-minded fellow as a cad and a boudoir for thinking such a thing. The very idea! We all knew that wouldn't happen.

J.W. Lowry Jr.  
Task Force Coordinator  
Structured Programming Task Force  
McDonnell Douglas Automation Co.,  
Long Beach, Calif.

### Connole Forgot One Ingredient: Competition in World Markets

I enjoyed reading the article "Concern for Workers Must Govern Automation" by Anthony W. Connole [CW, Sept. 25].

I think Connole presents some very strong arguments regarding the social aspects in the use of computers for automating industrial operations. In fact, I was glad to hear that the United Auto Workers, along with other unions, have endorsed the use of such equipment.

But Connole states "workers given the choice between unemployment with technology and full

employment without technology would opt for economic survival." This is understandable from the workers' standpoint, but I cannot understand it from his standpoint as a labor executive.

Apparently, speaking in his capacity for the union, he discusses the competitiveness of our products in worldwide markets.

Maybe Connole could expand on his ideas for increasing unit output per worker using an automation technology that causes higher unemployment in certain occupations, as opposed to unemployment in many occupations because of industry-wide competition in the world marketplace due to low productivity per worker.

After all, we must compete in the world marketplace regardless of the current economic condition. Or maybe he is recommending competition only where we have a good economic condition in this country.

Howard F. Brenner

Baltimore, Md.

### Ability To Exercise FCRA Options Depends on Knowledge of Provisions

Lest Ken Opp's letter [CW, Sept. 25] provoke a "sez you" response, let me report that I have exercised my Fair Credit Reporting Act (FCRA) rights on three separate occasions with three different credit bureaus in the Philadelphia area.

No initial cost of credit was involved on any of the occasions, so I was exercising the lesser-known option.

The reaction varied from puzzlement to gentle antagonism, but in all cases I received the services to which I was entitled under FCRA, without difficulty or expense.

Opp's statements are completely confirmed by my experience. The problem now is to inform people of the rights they already have.

What use is a "Bill of Rights" if its existence is not widely publicized by us?

Robert Higgins

Newark, Del.

### Another Boost for Private Schools

I am writing in reference to recent articles printed against private D.P. schools.

I am a graduate of a D.P. school in Syracuse, N.Y. I had a D.P. in high school; I wanted further education so I signed up, I will match the education I have gained in the 6-1/2 months of my studies against any college degree.

Because of this school I earned one year of college courses, and the school I went to offered hands-on training as well as programming and systems work.

Private D.P. schools do not claim to turn out half-year wonders but they provide the best basic exposure to the field possible.

Bruce Donnelly

Cobleskill, N.Y.



## "I/O SYSTEMS"

**'74** Plan now to attend "I/O Systems '74," a three-day seminar exploring the design and control systems in the future data processing environment.

Sponsored by the Input/Output Systems Association, "I/O Systems '74" will be held November 13-15, 1974 in New York City at the City Squire Motor Inn, Times Square, New York, NY 10036. The cost is \$150.00 per person.

- Electronic Fund Transfer
- Symbolics
- Cash Dispensing Equipment
- Teleprocessing
- Terminal Systems
- Direct Data Entry—Key to Disc & Tape
- Mini/Computers/Microprocessors
- Voice Response
- OCR/OCR Management
- EDP Printers
- Input/Output
- Direct Sale
- Credit & ID Card Equipment
- Cash Dispensing Equipment
- Keep pace with the info explosion. Register now! Early registration is \$125.00 or \$50.00 per day. Contact V. Tsipis, Input/Output Systems Association, P.O. Box 1332, Stamford, Conn. 06904. Ph. (203) 323-3143.

## Plain Talk on Privacy — Part 1

# What Do We Gain by Ignoring Issues?

By Daniel B. Schneider  
Special to Computerworld

It is a good bet that within three years every reader of this article will be personally affected by the issue we call "privacy."

The way we design, implement, operate and manage information systems will undergo fundamental changes. For those of us who are managers, new responsibilities and liabilities will fall on our backs and shoulders.

Yet as a body of professionals we have been reacting in the most unprofessional of ways — by trying to ignore the basic issues.

We tell ourselves and one another that we must cope with "privacy" but that "privacy" in the business of lawmakers, judges, civil libertarians, attorneys and sociologists — that is, everybody but us technicians.

To see better the position we are in, let us look at five specific items that illustrate what our self-imposed neutrality is gaining us.

### Impact Statements

**Item:** The Domestic Council Committee on the Right of Privacy has developed the idea that something called a "privacy impact statement," "privacy impact document" or "privacy report" be submitted to each agency that may propose an information system or major modification to an existing system. This idea has found sympathy in Congress and may well become law.

(In this context and in general, read "privacy impact statement" as "second data system" to mean any system, regardless of technology, that contains information about an organization's employees, customers, clients and suppliers, to the extent that the latter entities are individuals; where the data is to be identified to specific persons; and systems specifically about people, such as credit data banks.)

If the originators of this idea wanted to know how you propose to protect personal data, they would have called it a "security statement."

If they merely wanted to know who will have what access to personal data, they would have called it a "system description."

What they in fact are asking for is a catalog of all the possible damages that an employee, customer, credit-seeker, etc., might suffer as a result of the normal operation of your information system, plus all of the possible damages that might flow from such unplanned events as negligent or malicious use of system data.

This is a "what could go wrong?" exercise with a twist we had better examine closely. It requires the participants to make value judgments about people.

In fact, the whole idea of privacy statements is a bureaucratic reaction to frustration. Its proponents are really saying, "We can't define privacy standards for a technology we don't understand, and because you technologists are not helping us we'll just put the monkey squarely on your back."

### Data Classification

**Item:** Most of the privacy bills that have been introduced in Congress this year call for categorization or classification of information.

Categorization appears to be seen as an aid to the development of security controls; presumably we would have some hierarchy of security controls which would correspond to a ranking of elements of personal information according to sensitivity.

The very notion of sensitivity is based on the damage that could flow from misuse of data, but damage is something done by people. The extent of damage is a function of many factors including, but

certainly not limited to, the number of individuals damaged and the vulnerability of those individuals.

The determination of sensitivity has to be a function not only of the information element but also of the persons having access to it and of the time, place and circumstances of the access. One such circumstance is the combination and/or order of elements accessed.

Again, sensitivity is dynamic, and a given data item might well appear in every one of the classification ranks.

Now superimpose this on your current systems and on your IMS and Total data bases and you should see the first reason for objecting to classification.

The second reason why categorization is a mistake is ethical. Privacy is bound up

## Viewpoint

with individual dignity and freedom. For years we have been accused of undermining the individual by reducing him to an impersonal number and statistic; will we continue to rob him of his individuality by trying to put those things that define him as a person into separate boxes? Will we continue to believe that serious classification requires a third-person value judgment. Who is so arrogant as to say that our neighbor's marital status is a category eight sensitivity and his bank account number is a category two?

**Item:** Much of the present draft legislation embeds the concept of "sensitivity" in the HEW advisory committee that says whenever personal information is collected it be for a specific purpose which has been made known and that the information not be used for another purpose without the individual's consent.

While no one is likely to object to this idea, the definition of "sensitivity" is critical. If "sensitivity" is defined in sweeping generalities, it will make a mockery of the safeguard. If "purpose" is defined in the narrowest sense, it will drastically impact our systems and our developing data base technology.

### Undefined Mandates

**Item:** Almost without exception the proposed laws contain mandates for reliability, accuracy, completeness, timeliness and pertinence of personal information.

Needless to say, these good things are not defined. But the existence of wrong, incomplete, untimely or nonpertinent data in one of your systems could result in an action for damages and an injunction brought against you and/or your organization by an affected employee, customer, credit subject, etc.

**Item:** We DP types have existed in relative obscurity in our organizations. There has generally been a buffer — in

(Continued on Page 14)

coming up in  
**Computerworld**

Date	Ad Close
Nov. 27	Nov. 8
Dec. 25/	Dec. 6
Jan. 1	

## don't miss these informative special reports

See your Computerworld Salesman, or call Judy Milford at (617) 965-5800 for all details.

**COMPUTERWORLD**

**HELP!**  
WE NEED A [68] !

WE HAVE AN URGENT  
NEED TO INSTALL A  
168 ON OR BEFORE  
DEC. 27<sup>th</sup>.  
• WILL BUY OR EXCHANGE DELIVERY DATES.

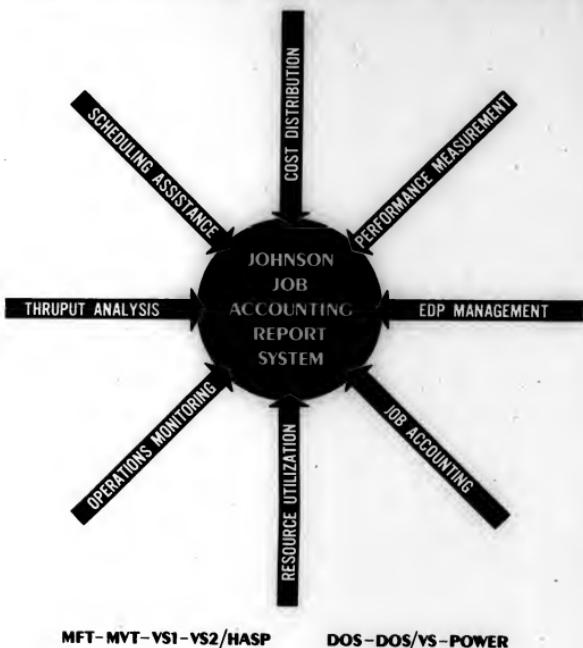
Reply to: CW Box 4205, 787 Washington St., Newton, Mass. 02160

...the main reason more manufacturers do not sell  
is that it requires a product that ~~has~~ value.

requires something else, too — the lonely courage to  
stand out from the crowd, to make your products even  
better year in and year out, regardless of the ~~opportunistic~~  
situation. Perhaps this is the rarest quality of all. It  
only be called Leadership.

GRAHAM  
MAGNETICS

## FAST BECOMING THE STANDARD



**Johnson Systems, inc.**

The Grant Building / Westgate Research Park / McLean, Va. 22101 / 703-893-8700  
Santa Ana, California / 714-835-2322,      Oak Brook, Illinois / 312-325-7740

**PANVALET**  
The program management  
and security system.  
**for PROGRAMMERS**  
Easy, 10-digit program I.D.; simplified  
program maintenance; and protection  
for production programs.

1500 users  
can be wrong.  
Shouldn't you be  
using Panvalet?



**PANSOPHIC  
SYSTEMS, INC.**

1501 W. 2nd St., Oak Brook, IL 60521  
Fax: 312/525-9712  
Cable: 213/CB-7551  
West: 213/CB-7551

## Letters to the Editor

### 'Smart' Cross-Reference A Useful Option

R.A. Sobczak's suggestion [CW, Oct. 9] of a "smart" assembler cross-reference (listing only the symbols referenced rather than all symbols defined) would be a useful option. Cobol and other higher-level languages, of course, could also benefit from this feature.

Additionally, a "smart" cross-reference might include XREF ON/OFF (allowing areas of a program to be explicitly excluded from the cross-reference), differentiation between store (STO) and fetch (MOVE FROM) references, local cross-references for certain areas of the program and better tabulation of assembler register references.

If there is sufficient interest, we will develop a "smart" cross-reference feature for our current program editor, The Sorcerer [CW, Aug. 28]. Interested parties should communicate their suggestions to us.

Charles A. Mills

Marcus Powell Associates  
2694 Dodge Ave.  
Pinole, Calif. 94564

### What Can We Gain By Ignoring Issues?

(Continued from Page 12)

some cases a director of employee relations or a vice-president for customer service - between us and an irate employee, customer, etc.

Now that lawmakers will be requiring public and private organizations' personal information systems, including the business address and telephone number of the "person immediately responsible" for the system, what is the outlook for our involvement? Is the vice-president of sales "immediately responsible" for the accounting, payroll, system or area?

These items point out some important lessons for us:

- Many of the people framing privacy policy are approaching the problem by a combination of vague palliatives and shifted responsibilities.

- Privacy policymakers are not immune to error and are quite capable of proposing cures that are as bad as the disease.
- Privacy policymakers generally have little understanding of our profession and its terminology and figure that, in any event, we are not the ones they are looking out for.

Who is looking out for us? Who is advising the government executives and policymakers when they get on the wrong track?

Schneider is an information systems specialist in Washington, D.C. In Part II, he offers some answers to the problems posed above.

# SOFTWARE & SERVICES

## Move to Major Application Package Takes 3 Years

By Nancy French  
Of the CW Staff

HARTFORD, Conn. — While some companies buying a program package is the simple solution to a problem, systems analysts at The Hartford Insurance Group who recently adopted IBM's Advanced Life Information System (Alis) will testi-

fy it takes a lot of planning and testing to make one work.

The project, which lasted three years for planning and testing and spent \$2 million on its conversion, The effort, which involved transferring 230,000 insurance policies previously processed on an IBM 7010 tape/batch system to a combined

data processing and teleprocessing network, spawned paperwork changes in every department.

With the new system, all routine transactions are handled and inquiries from RTI terminals in the field get responses within seconds.

Night batch runs update every policyholder's account in his policy with one of 29 stock computer-printed messages.

But the conversion didn't happen overnight.

Jerry Tompkins, assistant director of the DP Systems Department, explained the conversion was a "user-oriented project." He said:

The project team developed and ran a model system and, by examining the results, they determined what modifications were needed.

"We used the Project Control System (PCS) as a project control aid," Tompkins said.

"About 1,800 tasks that had to be accomplished were defined to the PCS system. Then the tasks were put into a network of dependencies," he explained.

### Biggest Problem

"The biggest problem we had," Tompkins said, "was cleaning up the existing records so that the new system would not reject them. Our records were incomplete, and their age and accuracy were not what they should be."

"We had to do a lot of 'conversions,' file by file, in modest batches," according to Tompkins, because it "involved an awful lot of machine time."

"Each time we'd take a look at the

fallout, and then the users had to dig in and make corrections," he explained.

Finally, in January 1973, all processing under the old system was stopped, and activity reports began accumulating. By Christmas pilot conversions showed a success percent rate high in the 90s, according to Tompkins, and Hartford was ready for the final conversion date.

For the start, the company "jumped off into the dark" fully committed to the new system. No dual system was used, Tompkins said.

"As soon as we converted, we began a series of catch-up cycles to work off the backlog," he explained, and the system has made life easier for users ever since.

While IBM gave employees some training in the early stages, The Hartford hired consultants to convert IBM's DOS version of Alis to OS.

In addition to holder inquiries, the system's data retrieval capacity helps speed up policy loans, commission computations and actuarial calculations, Tompkins noted.

The new program is run on the same equipment as The Hartford's Total Information System (TIS), which handles two million agency and individual homeowners lines. The system employs 300 terminals in 50 locations tied directly to the home office where three 370/158s, each with 2M bytes of memory share processing chores with one 3.5-byte 165.

Tompkins said the system is expected to have a five-year life span and new products will have to be "bent" to work on the existing system rather than changing or replacing the system.

## 'Heals II' Eases Maintenance For Larger Honeywell Systems

WELLESLEY, Mass. — Honeywell has announced two packages designed to simplify maintenance and improve transaction processing capabilities for its large-scale systems.

The Honeywell Error Analysis and Logging System (Heals II) provides advance warning of potential hardware malfunctions.

The Transaction Driven System (TDS) provides Series 60 Level 600 and Series 6000 systems with a self-diagnostic program necessary for simultaneously processing heavy volumes of transactions from a large number of remote terminals.

Most failures in computer systems start as intermittent errors that can be corrected immediately through retry and recovery techniques. Although a user is not generally aware of the errors at first, the retry and recovery techniques tend to decrease system throughput and increase in frequency until they are no longer recoverable. Heals II pinpoints the errors so they can be corrected before they reach this point, Honeywell said.

Heals II is an update of the earlier Heals I system and provides more analysis of total systems — including peripherals and

storage media as well as processors and main memories, a spokesman said.

Heals II is available immediately at no extra charge to all Honeywell Series 60 Level 66 and Series 6000 customers with Honeywell maintenance contracts.

TDS, the other new package, is a communication "extension" designed to facilitate the receipt and dispatch of a virtually unlimited variety of computer terminal messages with information required from a common data base.

It is said to be completely compatible with other Honeywell data and communications components, including the Remote Terminal Supervisor and Network Processing Supervisor.

TDS benefits include high throughput and short response time for heavy on-line traffic, management of system and data integrity without degradation in performance; fast recovery in case of equipment or software failure and concurrent access to a large common data base without interference for retrieval and update operations, according to Honeywell.

TDS is available immediately to Honeywell customers at a monthly lease price of \$1,000.

## 'Score-II' Interleaves PDP-11

ORINDA, Calif. — Still another real-time executive system is now available to DEC PDP-11 users with the announcement of the Score-II package from Virtual Memory Systems.

Score-II supports process control, data acquisition and data communication environments, but it also serves as a basic building block for time-sharing and general multi-programming operating systems, the vendor said.

### Priority Scheme

The software provides multi-programming capability on an interleaved execution basis. Individual programs or tasks may operate independently or together to accomplish processing objectives.

Software priorities are used to select which task to run in the event two or more tasks are simultaneously competing for CPU use or other shared resources.

System tasks supported by Score-II

include a means of communication between the operator and the Score-II executive itself.

### Subroutines

Another system task copes with power failure/recovery including a display of the time and date of each failure. Internal tasks are used to support the system by the fifth system task, a spokesman added. A reentrant subroutine library, meanwhile, provides extended arithmetic and code conversion facilities.

A minimum Score-II digital hardware configuration includes Digital Equipment Corp. PDP-11 CPU with 8K memory, a local frequency clock, an asynchronous serial interface and a console keyboard/display device.

Score-II relocatable object modules are available for \$2,400, while source code is \$600, from Suite 3, One Northwood Drive, 94563.

## 16-Bit Mini Runs Multitasking

OCEANPORT, N.J. — The total number of concurrent tasks, both foreground and background, that can be controlled by

Interdata's OS/16-MT operating system is limited only by the amount of memory available on the user's 16-bit mini, the vendor claimed.

The system is designed for original equipment manufacturers and end users with industrial automation, process control and laboratory applications. The multitasking supervisor allows the system to perform up to eight application tasks in foreground and background program development work simultaneously, Interdata noted.

OS/16-MT has four categories of tasks: from system functions through foreground and resident background tasks, and embedded task transfers. Tasks transfer and overlay for higher level tasks are loaded from the system's disk storage library.

In use, multiple application programs operate concurrently on an interleaved basis, but up to 16 levels of priority determine task execution sequences. The console operator can communicate with tasks and intertasking commands permit

task-to-task communication, the company added.

I/O operations are programmed through Supervisor Call instructions, which pass application programs to the OS/16-MT system. I/O operations are device independent, the vendor noted, with device selection made at run time without being dependent on user application coding.

User coding can be in Assembler, Fortran IV, Fortran V or an extended form of Basic. Both Fortran IV and an extension of Fortran V, which produces Assembler source code as output and is designed for operations that cannot be handled easily with conventional Fortran IV.

OS/16-MT programs can be upgraded easily to run under either OS/32-ST or OS/32-MT, the company's 32-bit and 32-bit machines, the company said.

OS/16-MT itself requires only 4K to 12K bytes of memory. It will run on any 16-bit Interdata mini with 16K bytes and it supports Interdata's complete line of standard minicomputer peripherals, the company noted.

The system is available now for \$950 from Interdata, 2 Crescent Place, 07757.

## MMS General Ledger Stands Above the Crowd.

The MMS General Ledger is the choice of more than 100 of the country's leading corporations.

The system they selected isn't merely a "software package," however. It's the MMS General Ledger, which offers unusual flexibility because of unique data base design. And it can be used in DOS, O/S, IMS, or even TOTAL. Best of all, the MMS General Ledger is proven, reliable, and

It's no wonder, then, that the MMS General Ledger is the World's No. 1 seller. Because it makes sense to get the best corporate financial reporting system. And that's the MMS GENERAL LEDGER!

I'd like to stand head and shoulders above the crowd... please send me more information on your accounting corporate financial reporting system.

General Ledger     Accounts Payable     Accounts Receivable

name \_\_\_\_\_ title \_\_\_\_\_ system \_\_\_\_\_

company \_\_\_\_\_ street \_\_\_\_\_ zip \_\_\_\_\_ phone \_\_\_\_\_

city \_\_\_\_\_ state \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

New York (212) 972-9540 Chicago (312) 729-7410 Atlanta (404) 266-0039

San Francisco (415) 371-0331 Los Angeles (213) 437-3301

**SOFTWARE**  
**INTERNATIONAL**

Finnegan-Audited Member WIBPO JAPCO INC.



# COMPUTER CARAVAN

is one of the things you'll be seeing at the 1975 Computer Caravan—the traveling computer users' Forum and Exposition. And here are some of the companies who will be exhibiting products or services in this field:

Control Data Corporation  
Data General Corporation  
3M Company,  
Microfilm Products Division  
Scope Data, Inc.  
Potter Instruments Company, Inc.  
California Computer Products, Inc.  
Stromberg Dataphix  
Hazeltine Corporation

**Make sure you're there when The 1975 Computer Caravan comes to a city near you.**

**The Computer Caravan/75**  
sponsored by:  
**COMPUTERWORLD**

797 Washington Street Newton, Mass. 02160  
(617) 965-5800

ATLANTA • PHILADELPHIA • BOSTON • NEW YORK  
CLEVELAND • CHICAGO • ST. PAUL • SEATTLE • SAN FRANCISCO

REAL TIME/SECURITY/PREVENTIVE MAINTENANCE/EXTERNAL LABELS/MOVEMENT CONTROL/SCRATCH CONTROL/CLEAN/

**TAPE**

**LIBRARY**

**MANAGEMENT  
SYSTEM**

**- TLMS -**

May we tell you more?

Gulf Oil Computer Sciences, Inc.  
P. O. Box 2100  
Houston, Texas 77001  
713/228-7040

## Parameter Cards Shape Payroll, Personnel Work Done by 'Q-Pac'

ANDOVER, Mass. — With help from the DP staff, clerks in end-user departments may be able to set up and then modify as needed the processing done by the Q-Pac Payroll, Personnel and Labor Costing System, available now in the U.S. and Canada from Software International.

The system is controlled through entries on "parameter-selectable" input coding sheets which become, after keypunching, a set of parameter cards. Multiple sets of control cards can be used during a single run of the program, allowing each division within a company, for example, to be treated differently.

The system also includes several modules covering payroll processing, tax calculations, personnel recordkeeping and labor cost accounting. In addition, the system has both an extraction subsystem and a report writer module support user needs beyond the parameter-selectable "menu" of standard reports.

A general ledger interface, mailing label subsystem and check reconciliation sub-

system completes the application-oriented portions of the Q-Pac system.

The payroll processing routines support a broad range of wage and salary schemes, deductions and payment methods.

The personnel recordkeeping subsystem can be as simple or complex as the user desires, through the use of variable-length records. Each record can contain up to a maximum of 2,640 bytes for each employee through parameter card changes and the entry of the new data. Such changes will not affect processing previously defined by control card sets, the vendor noted.

One module designed to operate on IBM 360/370 systems, the largest of the 34 programs in the system is 45K under DOS and 75K under OS. The system is coded in Cobol and Assembler and sells for \$25,000 (DOS) or \$30,000 (OS).

The price of the tax module is separately priced after the first year at \$1,800/yr., a spokesman said from Elm Square, 01810.

## Program Goes With Tape, Disk

SANTA CLARA, Calif. — Users having a year's supply of tapes and disk packs from Memorex are offered a free software package, Procedure Library Scanning (Proscanc), which converts tape and disk data sets as they are shifted from one medium to another.

The package reduces "significantly" the time normally required for modifying the files by eliminating manual Job Control Language (JCL) changes. It also relieves programmers of the chore of scanning printouts of JCL procedure to identify which members require changes, Memorex said.

When upgrading from an IBM 2311/2314 to an IBM 3330 environment, called Memorex 3660 to IBM 3330 or from Memorex 3660 to Memorex 3670, Proscanc reallocates data set space in accordance with the tighter packing densities of the advanced drives, a spokesman explained.

By extending the package beyond its original purposes, users are able to identify all occurrences of a specified character string through one parameter card entry and, with another card, to change them. Reports generated by Proscanc include

an updated "proc" list, a conversion exception list (with data sets that were not converted because they would occupy less than a half track on the new device) and a Proscanc monitor list. In addition, the system documents the reason for each conversion.

Memorex is at San Tomas and Central Expressway, 95052.

## Hospitals Go On-Line With NCR's 'Medics'

DAYTON, Ohio — A computerized communications system for hospitals called NCR Medical Information and Communications System (Medics) was developed for hospitals in the 200- to 500-bed range and provides on-line data collection, message switching and inquiry capabilities.

The system is designed to work in tandem with a second NCR computer system devoted to routine batch processing. The second system also provides backup for the on-line system.

Medics serves six functional areas of the medical — fiscal, nursing, professional, general and administrative services and medical staff communications.

Minimum hardware for the on-line system consists of an NCR Century 101 computer with 64K memory and communications capability plus a combination of NCR 275 hospital terminals with automatic wand readers, NCR 260 general communications terminals, and NCR 796 CRT terminals. A 64K Century 101 is the minimum configuration for the batch system.

In the on-line system, data is collected as services are ordered for the patient. Services are automatically priced and posted to the patient's record. As needed, the information is routed to other areas of the hospital, the company said.

### Open Messages

Terminals can also be used by the medical staff for sending open-format messages to other departments. Selected data collected on-line during the day can serve as input for subsequent batch processing.

Delivery of the system begins in December. The software licensing fee for Medics, including installation and maintenance, is \$1,000/mo for 36 months, \$5,400/mo for 12 months or a one-time payment of \$60,000.

Price for the on-line batch processing system and the Medics on-line communications system, including hardware and software, will range from \$2.50 to \$3.50 per patient day, NCR estimated.

CLEAN INTERFACE/MULTIPLE CPU'S/QUALITY CONTROL/OS/300/370/LABELS/MOVEMENT CONTROL/SCRATCH CONTROL/CLEAN INTERFACE/MULTIPLE CPU'S/QUALITY CONTROL/OS/300/370



## Cash Control Added To Leasco Library

GERMANTOWN, Md. - Small and medium-sized companies in any of a dozen metropolitan areas across the country may be able to analyze and control their payables by utilizing the Cash Disbursement (C/D) system now installed on the Response I service of Leasco Response.

Response I service is implemented on Hewlett-Packard minicomputers located in various Leasco branch offices. Programs such as C/D, therefore, are not designed to produce a single data base accessible from multiple geographically disbursed locations of a user company, a spokesman said.

C/D permits management of the liability cycle, from entry of the unpaid invoice and other documents through check re-conciliation, he said. The system provides for both permanent and temporary vendors and is designed so that open items can be entered directly from the vendor documents.

Leasco has developed the cash disbursement system to be compatible with the general ledger accounting system, also installed on the Response I HP minis. Transaction entry tapes can be generated for C/D users who also have the ledger system, the company noted.

Response I - and the C/D system - is user friendly, designed for teletype-writer terminals in the user offices linked to the Leasco office over the public telephone system through acoustic couplers.

C/D is available for normal Response I time charges, with a \$100/mo minimum, after payment of a one-time \$100 fee that covers installation of the software, help in setting up files and training of user personnel.

Leasco is headquartered at 20030 Century Blvd., 20767.

## 4800 Calculator From Victor Provides Key to EDM System

MARBLEHEAD, Mass. - A desk-top "computer" system to give managers easy-to-use forecasting facilities, the Evaluating Decision Model (EDM) system, consists of a programmable Victor Computer 4800 calculator and a library of software routines developed by Zircon Co., Inc., the company marketing EDM.

The 30 or so programs include corporate performance modelling, manufacturing cost analysis, financial modelling and profit-and-loss and other budgeting applications. By putting this kind of information in managers' hands (almost literally), EDM provides more decision-making support than many mainframes or intelligent terminals, Zircon claims.

The Victor Computer 4800 has a capacity for 1,000 steps of program logic independent of data storage plus a number of registers for control and accumulation of totals.

EDM, including the 4800, costs from \$3,000 to \$5,000 depending on programs in the unit and can be ordered through P.O. Box 301, 01945.

## Re-starting all over is all over.



You're running a critical production job. And suddenly the equipment or the program bombs out. You know the problem.

So you restart again and again, at the cost of valuable programmer and computer time.

With UCC FIFTEEN, restarting is a matter of seconds, not hours. You start at the proper job step. The OS catalog is corrected. Unnecessary direct access data sets are automatically deleted. And GDG biases are properly altered for the rerun.

The manual errors that normally occur when a job is restarted are eliminated. This saves time. You can start over when something goes wrong. Or, there's no need to worry about what happened. UCC FIFTEEN. And the problems of starting all over will be all over.

- Please send me more information on  Have someone call me about:  
 UCC ONE (Tape Management Software) a program that protects your data under OS/VS. It provides real-time record of tapes, jobs, etc.  
 UCC TWO (DOS under OS). Lets you run DOS programs under OS control without reprogramming. Puts you in charge. Saves time, money. Prevents confusion.  
 UCC TEN (Data Dictionary/Manager). For IMS users, this system identifies, defines and maintains data structures. It automatically generates data base control statements, facilitates new systems design  
 UCC FIFTEEN (Restart Management System)

Name _____	_____
Title _____	_____
Company _____	_____
Address _____	_____
City/State/Zip _____	_____
Telephone _____	_____

DM 1174 Mail to UCC, Software Products, P.O. Box 47911, Dallas, Texas 75247. Or call (214) 637-5010.

When you have the best people,  
you have the best product.

**UCC**  
**UNIVERSITY COMPUTING COMPANY**  
7200 Stemmons Freeway • P.O. Box 47911 • Dallas, Texas 75247  
A Wyly Company

## CCP/TAG...NOT JUST ANOTHER CICS...

### MONITORS

Modular Concept permits most any terminal . . .  
BTAM . . . 270x . . . 370K . . .  
designed with integrated  
communications boards in  
NCP environment . . .  
AUDIO/VIDEO/TTY/IBM/  
360-30 to 370-168  
Dynamic efficiency

### SCHEDULER

- Designed so intervals can be defined quickly
- single or multi thread
- terminal independence.
- data management with RAM, planned virtual storage/program library
- logging, Disk & Core queueing w/priorities

### TAG

A MACRO language designed for easy application programming. Makes TPD programming as easy as Batch card programs in COBOL. Complex delimiting with ease.

### VIDEO-PUNCH

Use your video terminals as keypunches. Replace your keypunches then proceed to TP in a payout environment. POWERFUL COMMAND LANGUAGE

### BCC/ICC

50 Allison Ave.  
Newfoundland, N.J. 07435  
Name \_\_\_\_\_  
Company \_\_\_\_\_  
Title \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

I AM INTERESTED IN

CCP  TAG  VIDEO PUNCH  
Phone (201) 361-0818

BCC/ICC...INVOLVEMENT + EXPERTISE = RESULTS...DOS/OS/VS

# "Once and for all, let's clear the air about air shipping."



## The Imitators:

They can get your shipment on a flight eventually.

They can get you an airplane.

They can land your shipment at an airport.

They can deliver your shipment to major cities.

They can use multiple carriers to handle your shipment.

## The Differences:

REA Air Express gives your shipment priority on the first flight out.

REA Air Express gives you an airline partnership.

REA Air Express can deliver to your receiving dock.

REA Air Express delivers to 450 airport cities and 22,000 communities.

REA Air Express delivers via one carrier, one management all the way.

Get the point? There are hundreds of air shipping services making hundreds of claims and promises but the simple, important fact for any shipper to remember is that no single company can offer all the services and advantages of REA Air Express. The moral: Don't be fooled by imitators. When you have something to ship, insist on the original Air Express - REA Air Express. For a fast pick up, check the white pages or for a complete brochure write to: Tom Kole, President, REA Air Express, Dept. AE10, 219 East 42nd Street, New York, N.Y. 10017.



## AIR EXPRESS. The Difference.

The air shipping division of the REA Express system.

# Computer leasing by the book.

Find out about Randolph's approach to computer leasing...customer service, DOS support, systems performance monitoring, conditional sales, system upgrades, installation practices, and more...in our new 4-color brochure. Call or write your nearest Randolph office today!



Northwest  
637 Brookfield Road  
Greenwich, CT 06830  
(203) 861-1777

East  
100 Franklin Street  
Boston, MA 02109  
(617) 484-0470

611 Country Club Road  
Bethesda, MD 20811  
(301) 973-0495

West  
20 Cornhill Place  
Palo Alto, CA 94301  
(415) 444-6820

Midwest  
200 Phoenix Park Dr. NE  
Atlanta, GA 30305  
(404) 955-0502

Southeast  
1110 Executive Blvd.  
Chesapeake, MD 20828  
(301) 775-0800

800 North Michigan Ave.  
Chicago, IL 60611  
(312) 787-4294

West  
One Whistler Blvd.  
One Whistler Blvd.  
(714) 856-4190

805 University Ave.  
San Francisco, CA 94101  
(415) 362-1000

West  
"B" Street  
San Diego, CA 92101  
(714) 236-5401



**RANDOLPH COMPUTER COMPANY**  
Division of Randolph Financial Corporation  
A member of the First National Bank of Boston  
Member of the American Bankers Association

# DP DIALOG

Notes and observations from IBM which may prove of interest to data processing professionals.

**DP DIALOG appears regularly in these pages. As its name suggests, we hope DP DIALOG will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP DIALOG, IBM Data Processing Division, White Plains, N.Y. 10604.**



Dan Heintz discusses career objectives with LaVastrice Jones after she has run through a computer-based career program.

## The Search for the Right Career

Choosing a career is a difficult decision most students confront sometime during their education. For many the decision is often based on inadequate information on the number and variety of career opportunities and generally

insufficient knowledge of the educational training needed for each.

Students at 75 schools across the country are getting help from an innovative program called the Computerized Vocational Information System

(CVIS). It was started in 1967 at Willowbrook High School in Villa Park, Illinois under the direction of Dr. JoAnne Harris. An interactive system, CVIS enables students to compare their own abilities, interest and grades with infor-

mation on some 500 different occupations.

Using the Willowbrook system as base, Proviso Township High Schools, just outside of Chicago, further developed CVIS to make it function as a total data base. On the East campus, 3,800 students are using CVIS. An additional 4,400 students are served on the West campus.

At visual display stations, students answer preprogrammed questions and indicate their interest in various career opportunities. The school's System/370 Model 150 computer is used to keep track of their progress.

Dan Heintz, Vocational Counselor at Proviso East, says, "The system has already helped our counseling effort immeasurably. Instead of spending time hunting for information, our counselors can now spend more time counseling. They also have access to up-to-date information on a wide variety of careers."

Besides keeping track of career opportunities, CVIS also provides information on some 1,600 colleges, as well as specific information on vocational schools. "By the end of the year," says Howard Schumacher, Director of Management Information Services for Proviso Township High Schools, "the system will also include information on financial aid and local jobs."

CVIS gives our students a chance to see the number of careers available to them and helps them focus on their own potential and interest," says Dan Heintz. "We hope that information provided by this system, together with our own counseling efforts, will help steer these students in the right direction."

IBM

## Computer Aids Children of Migrant Workers

Billy is in the fifth grade classroom for the second day in Thomassville, Georgia. His teacher knows he has a way with numbers, difficulty reading either English or Spanish, and has a 20% hearing loss in his left ear—probably because of a case of measles he had when he was six.

Two years ago, it's likely that the school wouldn't have known a fraction of this, and by the time it pieced together his background and took the first steps toward helping him, Billy would have been on his way to a new town, another school, and possibly the gloomy prospect of facing still another set of academic obstacles.

Today, Billy, the son of migrant farm workers and one of an estimated 900,000 such children in the United States, can stand a better chance of completing his education, but can learn there are ways of earning a living other than working in the fields.

Because of a computer-based communications network called the Migrant Student Record Transfer System

(MSRTS), Billy's education and medical records can now keep up with him.

The system is the result of a joint project between the federal government and the State of Arkansas, which

started in 1968 on an experimental basis. It now enables 8,000 school districts throughout the United States to obtain current scholastic and medical histories of more than 400,000 registrants.

stated migrant children. These records are stored in an IBM System/370 computer in Little Rock, Arkansas.

Using teleprinters linked to the central computer via telephone lines, authorized school districts can get needed information in a matter of hours. The records of each student are updated by means of the same equipment.

"The problem of educating migrant children is quite complex," says Alfred Miller, the system's administrator. "Schools along the country's three main migrant stream often have no way of knowing what subjects have been studied and what grade levels were achieved. Moreover, health records are often incomplete."

With the availability of MSRTS, at least a promising start has been made," says Miller. "It's only a small advance but it has large implications. Certainly it means the nation's migrant children have a better shot at schooling than they had before."

IBM

## Reading the Navajo Way



Learning to read can be difficult for any child. But learning in an unfamiliar language is an even greater struggle—one that 50,000 Navajo children must face every day.

These children are part of the largest Indian tribe in the United States—over 130,000 people living on a reservation which spans parts of Arizona, New Mexico, and Utah. Their attend school mainly staffed with teachers who don't understand Navajo or who are teaching Navajo children who don't understand English.

To help solve this educational dilemma, Dr. Bernard Spolsky, director of the Navajo Language Program at the University of New Mexico, has undertaken a project which will set out first to train Navajos themselves as teachers. Secondly, it will develop Navajo reading materials with the help of a computer so the children, when they first enter school, can learn in their own language.

"Then," says Dr. Spolsky, "once they have learned to read in their own language, a language they understand, they can begin to learn English in, say, the second or third grade."

The computer enters the picture with the development of the Navajo reading materials," says Dr. Spolsky who is also a professor of elementary education at the University and a first-grade teacher. "To develop effective first-grade readers, it is not enough to know the child speaks Navajo. You must know in detail how he uses the language—what words he doesn't use, what words he uses and precisely how he uses them.

He has done this by interviewing over 200 Navajo children on the reservation—in their homes and at school. There were no restrictions on subject matter: home life, coyote tales, space ships, whatever came up."

The material was then keypunched for processing on an IBM system at the university. "At this point we have a

body of speech of over 11,000 sentences, 53,000 different words and 8,775 different word types. Computer processing made it possible to do these analyses in as little as a day as we could gather in the time available."

The computer was able to run several analyses on this amount of data. It prepares a frequency, or an alphabetical index of all the words used in the interviews in context of the sentences in which they occurred. Then it ran frequency studies by word and word type, studies of individual letters and letter units and analyses of vowels and consonants. "All of these reports were extremely useful in helping us to assess the language intelligence for planning reading materials geared to the language the child is speaking."

The results of the complete computer analyses are in 13 new books, made for the first-grade reading level but suitable also for the intermediate and advanced levels. Dr. Spolsky recalls a typical story in one of the primers. "It has to do with the children and the school bus. The children board the bus, a rabbit gets on, a coyote gets on, then a bear gets on. All the animals are characteristic colors. Very quickly the driver stops and everyone gets off. It has an element of humor for the six-year-old, and also a kind of introduction to fantasy, all in terms familiar to the child."

In addition to the reading primers, the Navajo Reading Center has brought out ten publications that are reprints of older selections from Navajo history, long out of print.

"Could we have done without the computer? Concordances done manually are monumental projects. We just

couldn't have taken it on. In addition to our bilingual education work, the file in the computer provides the basis for further refinement of the Navajo language development process."

In 1940 the Navajos used virtually no English words and only a handful of Spanish words. Of the 53,000 words we have now classified, 500 are loan words from English. So the language situation on what is the past 30 years has changed somewhat in the past 30 years."

"Even so, the Navajo language has remained remarkably pure. In 300 years of contact with the Spanish, the Navajos borrowed only 30 to 40 words. That's something to be proud of in the language. They traditionally have not borrowed words, preferring to compound their own to deal with new entities."

In any event, Dr. Spolsky is optimistic about the future in helping maintain a vibrant living language and in combining basic research with actual teaching activities, using the most advanced technology.



## Computing Pioneers: Part II

In an earlier issue, DP DIALOG traced the evolution of calculating devices from the abacus to the late 19th century. A number of readers asked that the story be continued. So here are a few more of the events that led to the modern computer.



An automatic punch card sorter (1910).

growing acceptance throughout the next thirty years, although they were modified and speeded up to handle the ever-increasing needs of the government, business and scientific communities. To accommodate more information for business use Hollerith invented the use of the punched card itself. As his design model, he chose the dollar bill of the time.

Between 1900 and 1910, railroads began using "Hollerith machines" to tabulate waybills. Insurance companies, with actuarial statistics to correlate and analyze, were quick to see the advantages of mechanical tabulation. And public utilities, with countless customer records to maintain, also turned in growing numbers to machine accounting. More sophisticated methods such as cost accounting and sales analysis followed.

With the entry of the United States into World War I, the Wilson administration set up a plethora of public agencies to control transportation, communications, manufacturing and distribution. General Bell Telephone, the War Production Board established a dozen or more on committees at diverse (and unlikely) as baby buggies, biscuits and crackers, and pocketknives. To operate

effectively, these agencies needed rapid access to vast quantities of information, and thus installed large numbers of tabulating machines.

By the thirties, many large firms had established a "tab" department, but it remained for the government to undertake the huge task of bookkeeping, job, ever. The Social Security Act of 1935 made it necessary to maintain employment records for 26 million people. To handle this task, a punched-card machine, *punched, sorted, checked and filed 500,000 cards a day*.

By the mid-thirties technology had advanced to the point that adding, subtracting, multiplying, writing and arithmetic, were available—but separately, as individual functions of distinct machines.

From the 1938 Master's thesis of MIT student Claude Shannon, a way of using symbolic logic to improve electrical switching circuits. In one example, he showed how to automatically

add two numbers using only relays and switches. Although any numbering base could be used, Shannon said, the circuit would be greatly simplified by adopting the base two.

That same year, working independ-

ently, George Stibitz of Bell Labs built such an adder in his home. He called it the "Model K," after the kitchen table on which it was constructed.

At about the same time, Wallace Eckert of Columbia University used a mechanical programmer to link together different kinds of punched card and accounting machines to allow complex astronomical calculations.

Such developments foreshadowed many of the advances of the next decade. As early as 1937, Harvard graduate student Howard Aiken had proposed that a new kind of calculating machine be built. It was later to become known as the Mark I, the first automatic, general purpose digital calculator.



During World War I, the Army used punched-card sorters in the first large-scale application of psychological testing.

**IBM.**

# COMMUNICATIONS

## Data Briefs

### Informatics Division to Provide 'Hilo' Optimization Program

FAIRFIELD, N.J. — The nationwide availability of an application data service capable of pricing charges for the restructured AT&T private-line rates has been announced by Informatics, Inc., Data Services Division.

The Informatics Hilo Optimization Program is designed to minimize monthly telecommunications costs; identify optimal high density homing point centers; locate computer centers, PBXs and concentrators; compare high density and low-density routes; digital data systems and specialized services such as Tymnet, Wide FX, DDS and private-line networks; and provide private-line inventory control.

The program also provides network cost optimization for IXCs and Telpac users. Another feature is the capability of storing circuit, channel termination, service termination and conditioning charge details for billing comparison, the company noted.

The service, developed by DMW Telecommunications Corp., is available on a time-sharing or remote entry basis via multiplexer sites located in Boston, Long Island, New York City, Washington, D.C., Atlanta, Cincinnati, Chicago, Dallas, Los Angeles and San Francisco. It costs \$40/connect hour, a spokesman said.

### Tycoons Has Typewriter Attachment For Intelligent CRT Terminals

FAIRFIELD, N.J. — A typewriter attachment for intelligent terminals with CRT displays is now available from Tycoons Corp.

The Tycoons Model KSR-38 can be used with any available CRT terminals which have an RS-232 output. It is compatible with CRT terminals manufactured by Delta Data, Teletar, Datapoint, Ontel and others, Tycoons said.

The system includes a customer-supplied IBM Selectric typewriter and Tycoons electronics. The depressed keys of the Selectric are converted to Ascii code and the data is then transmitted at a rate of 15 char/sec.

Copy can be prepared on the Tycoons CRT terminal or the data can be drawn directly from a computer for printing on the CRT display. The revised copy can then be printed in hard-copy form on the Selectric or stored in the computer for later use, the company explained.

The KSR-38 offers all the standard Selectric typewriter including upper and lower case, 110- or 130-character write line, interchangeable type fonts and hard copy plus as many as 10 copies.

Price is \$2,350 for the Model KSR-38, not including typewriter, from 26 Just Road, 07006.

By Ronald A. Frank  
OF THE CW STAFF

CUPERTINO, Calif. — As most users still look forward to utilizing the first packet-switched networks, there actually is a company that has been offering that type of service for some time.

Tymshare, Inc. does not talk about packet switching, but it does admit that it provides "packet switching" on its own network, which serves users in this country and Europe.

The forerunner of the packet-switched network was the Advanced Research Projects Agency (Arpa) network, funded by the Department of Defense, which now links major universities and research institutions. The Arpa network was established in the Arpa net and in 1972 the two communications systems were linked together for a demonstration of the packet-switching methodology.

#### Complications Abound

Tymshare is primarily a time-sharing company that has configured its network to help implement its services. But things are not quite that simple in the world of regulatory procedures. Tymnet, Computernet, Inc. plan to be different from packet-switched or value-added services to users early in 1975. And Tymnet will operate as a common carrier meaning its rates will be approved by the Federal Communications Commission (FCC).

Some observers feel Tymshare is closer to being a common carrier because the communication lines are provided simply as an enhanced or value-added line facility, or whether the lines are part of a DP-related service. These observers point out that Tymshare can operate with much greater flexibility in setting rates than regulated companies whose charges have been raised by the fact that the firm offers different rates to different customers under contractual agreements. None of this is illegal for a nonregulated company, but it might give Tymshare an unfair advantage over potential rival value-added services companies such as Tymnet on Packet Communications, Inc.

The question of different contractual rates is firmly denied by William Coombs, president of Tymshare. He said, "We do not believe that all customers pay equal rates and the only variations apply to two Tymnet customers who pay more than \$20,000/mo in services. These customers get a volume discount." He added, "We are not able to tell all who qualify."

But Coombs has acknowledged that the regulatory question could be a problem and at a recent conference dealing with communications networks, he admitted Tymshare had an FCC application to become a carrier already prepared if such a need should arise.

From the user's standpoint, it now ap-

pears that Tymnet rates will be below those of Tymshare. Tymnet is now talking about \$27/hour while its costs about \$30/hour. Tymshare's rates are not yet known, still difficult because these figures do not include the processor that is required by a high-volume user to access a value-added network. A Tymcom III on-site mini costs \$2,150/mo, for example.

Officially Tymshare is operating under

place the Varian 6206 and 73s with Interdata 7/32 minis. This will upgrade the network to handle 2,000 bit/sec terminals including IBM 3780s and Data 100 equipment. Coombs said.

The 7/32 is a 32-bit mini introduced last year by Interdata. Other equipment now in the Tymnet system includes Xerox 940s, Decsystem-10s and a 370/138. Applications include about 70% financial business usage including financial and statistical jobs.

In mid-1976 Tymshare plans a further upgrade with Interdata 8/32 minis and then the net will support all terminal equipment up to 9,600 bit/sec. Coombs said. Interdata has not yet announced a date for its 8/32.

Tymnet uses all Bell facilities including modems but Coombs said that could change. Earlier this year Tymshare line charges dropped about 15% when the network was shifted to the high/low density rate structure. In addition, further savings could be possible if Bell's DDS service goes into effect, Coombs said.

At current rates a user with about 1,000 hours of usage per month pays \$7 to \$8/hour on Tymnet, \$19/hr on Wats lines and \$28/hr on dial-up facilities; he estimates that the new rates will allow him to incorporate specialized carrier lines in his Tymnet. Coombs said he is considering such a move. One of the drawbacks is that the alternate carrier cannot yet have the alternate routing capability required by Tymnet, he said.

the joint use provisions of FCC tariff 260. In a recent letter on this subject from Tymshare to the FCC, Coombs said, "It is our opinion that the fee charged by Tymshare to joint users for data message switching is outside the scope of our tariff responsibility."

The letter is also stated that Tymshare will be a value-added carrier and data service vendor, a term coined by AT&T that applies to value-added carriers. Interestingly, Tymnet services will also be classified by Bell with the same title and will pay the same rates. Clearly there is a residual issue between Tymshare and these companies involving the rights of carriers.

One of the main advantages for users is that the packet-switched companies are planning to offer higher-speed services. Tymnet currently handles relatively slow-speed terminals that operate up to 30 char/sec. But in March 1975 it will re-

place the Varian 6206 and 73s with Interdata 7/32 minis. This will upgrade the network to handle 2,000 bit/sec terminals including IBM 3780s and Data 100 equipment. Coombs said.

At current rates a user with about 1,000 hours of usage per month pays \$7 to \$8/hour on Tymnet, \$19/hr on Wats lines and \$28/hr on dial-up facilities; he estimates that the new rates will allow him to incorporate specialized carrier lines in his Tymnet. Coombs said he is considering such a move. One of the drawbacks is that the alternate carrier cannot yet have the alternate routing capability required by Tymnet, he said.

## Paradyne Details M-96 Lease Plan; Upgrades PIX Remote I/O System

LARGO, Fla. — Paradyne Corp. has announced a lease plan for its recently introduced 9,600 bit/sec modem line.

The M-96 is an all-digital modern modular line. It is a four-channel switch operating on four local private lines at 4,800, 7,200- or 9,600 bit/sec. The modem is designed for 9,600 bit/sec operation on Series 3002 lines with D-1 conditioning recommended.

The base plan offers both two- and three-channel terminals. On a three-channel plan, the basic model with local and remote features rents for \$150/mo. Prime shift maintenance is available at \$25/mo.

Paradyne has also upgraded the modular PIX family of remote I/O systems to run

at 9,600 bit/sec.

The PIX family is an end-to-end communications system for IBM 360/370 computers providing RJE (remote job entry) capability without the need for special communications software or conventional communications controllers and data sets, the company said. The 9,600 bit/sec PIX system can drive remote, high-speed line printers and card readers.

#### Typical Price

A typical PIX system including two 9,600 bit/sec modems, one 9,600 bit/min printer and one 1,100 line/min direct printer leases for \$2,380/mo. Prime shift maintenance is included. When the transparent data compression option is included, the 9,600 bit/sec PIX system will exceed the throughput achieved by most conventional RJE systems using 19.2 Kbit/sec wideband lines, the firm claimed.

Delivery is 90 days from 8550 Ulmerton Road, 33540.

### The quiet, reliable AJ630

The AJ630 is a solid state, non-impact printer terminal that has a lot to offer—speeds up to 30 cps • prints 140 characters to a line • holds a 15', 40' roll of paper • provides all 128 ASCII characters • two character buffer, plus options such as internal modem for DAA or acoustic coupler. There's a lot more in our 4 page brochure, it's yours for the asking.

1000 Main Ave., Sunnyvale, CA 94081 • (408) 736-4991

Advertising Dept., Anderson-Jones  
1000 Main Ave., Sunnyvale, CA 94085

- Send me the AJ630 Brochure
- Send me info on the APL version of the AJ630
- I would like a demonstration, here or elsewhere.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_



## TEC Upgrades Conversational CRT To Include 1,920-Character Screen

TUCSON, Ariz. — TEC, Inc., has an upgraded version of its buffered conversational CRT. The display is called the Model 2400 and includes a 1,920-character screen, a formatted 80 character line by 24 lines.

The 2400 has a serial asynchronous RS-232C interface, utilizes ASCII code, reads upper- and lowercase codes and displays uppercase characters. It is priced at \$1,650.

Features in the basic unit include blink, tab and protect formats, capabilities with protected areas displayed at reduced intensity.

Five cursor control keys assist operator data entry, and load and read cursor address features are provided, the company said.

A switch-selectable roll-up feature operates without delays up to 9,600 bit/sec. Data transfer rates are externally selectable in standard steps from 110- to 9,600 bit/sec.

Four existing cost options are available: transmission rate which allows data transmission at one speed and data input at another speed, \$65; rack mount, chassis, \$70; 16-key numeric pad



TEC Model 2400 Buffered CRT

on keyboard, \$110; internally mounted (at factory or in field) parallel or serial hard-copy adapter, \$150 to \$240.

TEC is at 9800 N. Oracle Road, 85704.

## IBM 2740-Type Terminal Has 32K Microprocessor

SANTA CLARA, Calif. — Data Measurements Corp., a subsidiary of Cetec Corp., has announced an intelligent terminal system within the DMC Series 400 line of programmable terminals.

The DMC 442 is compatible with IBM 2740 II communications protocol and includes a programmable microprocessor with up to 32K of memory and a 30 char/sec impact printer. The recently announced IBM 3767 is to include many of the features of the DMC 442, the company said.

Standard features include a high-resolution buffer, bidirectional LRC character buffer receive, edit-in feature and up to 2,400 bit/sec asynchronous or synchronous transmission speeds. The DMC 442 incorporates the Diablo Hytype 30 char/sec impact printer with variable 10- or 12-char/in. spacing, electronic keyboard and interface for optional 10-key numeric pad.

The programmable microprocessor with 4K memory standard, expandable to 32K, includes programmable read-only memories, read-only memories and random-access memories. The terminal system can be expanded to include a CRT and optionally a tape cassette, floppy disk, magnetic tape or card reader, the firm said.

Purchase price is \$5,750. Three- and five-year lease plans are also available. Availability is 90 days from 2115 De La Cruz Blvd., 95050.

## Four Years Later, Reserves Goes 'Up'

Special to Computerworld

TORONTO — Some four years and 320 man-years of effort have gone into planning and implementing Air Canada's Reserves II computerized reservation system. Indeed, that effort includes the establishment of system requirements, selection of equipment and the actual changeover to automated reservations.

The core of the airline's system consists of three Univac 1108 computers. The system went operational with two 1108s in 1970 and a third computer was added in early 1973.

Reservation personnel handle up to 90,000 transaction requests an hour.

At present the system is linked to terminals in 46 cities in Canada, the U.S. and in Europe, and the airline is studying the feasibility of extending the system to other countries, particularly to the inner and outer Caribbean.

The Toronto-based system contains a duplicate information storage base by backup.

In addition, with the Air Canada Cargo Computerized Reservation System (Acars), cargo agents can now locate goods through CRT terminals in Toronto and Montreal by punching a shipment's waybill number into the computer. The program is being extended across the airline's system and soon agents will be able to determine the stage of handling of company cargo shipments anywhere in the world.

# the new "Silent 700" programmable data terminal. **\$4,925**

Now, intelligence in a terminal is truly affordable! The Silent 700™ Programmable Data Terminal combines powerful microprocessing capabilities with the proven "Silent 700" features... at virtually half the price of comparable intelligent terminals.

Improved data entry efficiency. The powerful and easy-to-use TICOL language allows the user to generate "fill-in-the-blank" data entry forms, automatically check data for correctness, perform standard arithmetic functions, and tailor data formats for the user's system. All this can be accomplished locally... without the aid of a central computer.

Applications versatility. As an intelligent communications terminal, the new "Silent 700" model is ideally suited for such applications as catalog order entry, remote batch processing, inventory data collection and

reporting, and virtually all kinds of branch office preparation.

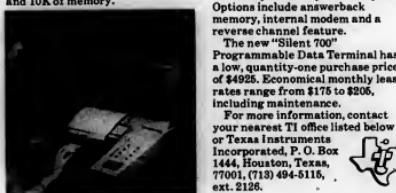
**Single data entry package**  
The Silent 700™ system contains all magnetic tape cassettes; quiet, non-printing 30 characters-per-second printing; USACSI keyboard with built-in 10-key numeric cluster; plus a hard-working microprocessor and 10K of memory.

### Communications flexibility

Data may be transmitted at rates up to 120 characters-per-second, either simultaneously with news data preparation or unattended at night. To add both flexibility and security to communications systems, we have a choice of switch-selectable ACK/NACK, XON/XOFF, and various communication protocols... and multidrop or dial-up line disciplines. Options include answerback memory, internal modem and a reverse channel feature.

The new "Silent 700"™ Data Terminal has a low, quantity-one purchase price of \$4,925. Economical monthly lease rates range from \$175 to \$206, including maintenance.

For more information, contact your nearest TI office listed below or Texas Instruments Incorporated, P.O. Box 1444, Houston, Texas, 77001, (713) 494-5118, ext. 2126.



**TEXAS INSTRUMENTS**  
INCORPORATED

\*Trademark of Texas Instruments

Atlanta, Ga. (404) 527-0000 • Atlanta, Ga. (404) 529-7791 • Boston, Mass. (617) 875-0100 • Chicago, Ill. (312) 527-0000 • Cleveland, Ohio (216) 861-1240 • Dallas, Tex. (214) 828-1240 • Denver, Colo. (303) 733-1240 • Detroit, Mich. (313) 875-7500 • Indianapolis, Ind. (317) 244-2240 • Kansas City, Mo. (816) 255-1240 • Los Angeles, Calif. (213) 459-1880 • Minneapolis, Minn. (612) 825-0111 • New York, N.Y. (212) 592-0900 • Orlando, Fla. (305) 847-0000 • Phoenix, Ariz. (602) 946-1240 • Portland, Ore. (503) 223-1240 • Phoenix, Ariz. (602) 946-1240 • St. Louis, Mo. (314) 871-1240 • Seattle, Wash. (206) 567-1240 • San Francisco, Calif. (415) 851-1240 • San Jose, Calif. (408) 265-1240 • Washington, D.C. (301) 961-1240 • Wichita, Kan. (316) 264-1240 • Worcester, Mass. (508) 873-1240 • Zurich, Switzerland (111) 827-0100 • London, England 01-582-3411 • Wien, Austria 01-634-1240 • Montréal, Canada (514) 332-1240 • Paris, France 01-562-2303 • Stockholm, Sweden 01-67-22-22 • Sydney, Australia 02-677-0100 • Tokyo, Japan 03-557-0100

## WANTED

### SOFTWARE COMPANIES

\$50,000 Minimum Annual Sales, Profitable or Unprofitable.

Write: D. Miller,  
B.B.S.  
P.O. Box 990  
Ontario, Calif. 91761



**Introducing Eclipse.**  
Suddenly a lot of computers don't look so bright.

The most expensive part of a computer isn't the computer anymore.

It's the people who work with it.

So Data General is introducing a family of medium scale computers that cut down on the work people have to do:

Eclipse.

You won't have to clean up the mistakes this computer makes. Eclipse has automatic memory error correction.

You won't have to rewrite complicated instructions every time you need them. Eclipse's microprogrammed architecture includes a comprehensive new set of instructions so powerful they do the work of entire subroutines.

You won't have to lose speed doing special subroutines with software. Eclipse has a Writeable Control Storage Unit that lets you keep them in the hardware.

You won't have to use assembly language to make your programs go fast. Eclipse is so fast it can run high level languages at assembly language speeds. (It has a bipolar memory cache that makes semiconductor memory a lot faster. Plus core and semiconductor memory interleaving for even more speed. And the fastest Floating Point Processor in the industry.)

And even though Eclipse is a brand new computer, you won't have to write a lot of systems software or jury-rig your peripherals. Eclipse is upwards compatible with the Novaline. So all the software and peripherals we've already made can go right to work on the Eclipse.

Write for our brochure. And see how bright an Eclipse can be.

**DataGeneral**

The computer company you can understand.

© Data General Corporation, Southboro, Massachusetts 01772, (617) 485-9100. Data Gen of Canada Ltd., Hull, Quebec, J8Y3S6.  
Data General Europe, 116 Rue de la Tour, Paris 75016 France. Data General Australia, Melbourne (03) 82-1361/Sydney (02) 908-1366.

## Disk spooler improves 360 run times up to 25 per cent!



Power-TM is a proprietary software package that has something very precious to offer you.

With it, any S/360 user with 64K bytes of core can sideline bottleneck jobs until there's time available to run them.

From our experience, that means an instant improvement in background

run time of between fifteen and twenty-five percent!

Power-TM is a writer-only system. It's economical, a simple addition to your system, and requires virtually no operator training nor intervention.

Let your nearest Dearborn office give you a first-hand demonstration.

But call right now. Every nanosecond counts.



dearborn computer leasing CO. chicago (312) 671-4410  
toronto (416) 621-7060 st. louis (314) 727-7277 cincinnati (513) 771-1277

Member Computer Lessors Association

## PROTECT Yourself and Your System

### CICS PROTECT

PROgram for Terminal Error (Recovery) Correction and Testing

### CICS UPWKWIK

Fast Check Point Restart System  
(When your on-line system goes down)

CICS

- Reasonably priced
- Minimal installation time
- Proven installed packages
- Complement Your CICS System

We are interested in CICS, Data Base, On-Line Systems and/or Program Products, and I appreciate that your firm may be able to assist.

Please send me \_\_\_\_ COPIES OF YOUR BOOKLET: -

"CICS-PITFALLS TO AVOID"

Please send information on UPWKWIK and PROTECT  
Please call me to discuss the specifics of our interest and to arrange a visit, where warranted, on the explicit understanding that there will be no cost or obligation whatever.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

**MANAGEMENT CONTROLS CORPORATION**

An Affiliate of Utility Computer Systems, Inc.  
100 Putnam Green, Greenwich, Connecticut 06830  
Tel: (203) 531-5351



## Dial-Up Facility Reduces Errors For Trucker's Freight Data Net

OAKLAND, Calif. — System 99, a California-based trucking firm, services more points and communities in California than any other single carrier, according to Tibor Gore, director of information services.

And in order to provide effective customer service, System 99 is using communications equipment to capture, transmit and process freight delivery receipts and administrative information.

Part of the reason for the use of the Wittek equipment, System 99 was using a leased-line, 10 char/sec network. This was an asynchronous communications system which was a combination of manual and automatic transmission techniques.

Out of 15 locations, only 10 sites were large enough to justify KSR (keyboard, send-receive) devices. Five locations had to rely on the mail or have their freight billing operation performed by another location equipped with KSR equipment. The daily volume of this network was almost 900,000 characters of freight bill information, Gore said.

While it was imperative that this data be accurately transmitted, there was no error-checking capability within the network, he continued. Consequently, there was a great deal of retransmission of messages.

The system had countless drawbacks, he said, including:

- Slow transmission speed. The network could handle only 65% of the traffic volume. There was no possibility of accommodating any growth in volume.
- The leased lines were prohibitive.
- There were line contention problems.
- The system demanded constant attention and manual coordination.

These drawbacks left System 99 no choice but to upgrade its data communication system. The updated system requirements included:

- The use of dial-up facilities rather than leased lines.
- High-speed, automatic transmission.
- Buffered and batch transmission.
- The capability of handling a growing traffic volume.
- Simple-to-operate terminal.

Several manufacturers of data communications equipment were considered, but after thorough evaluation, Wittek was chosen because it best met the needs to satisfy system requirements, Gore said.

"The concept of buffering is exactly what we were looking for."

At the present time, System 99 is utilizing Model 400 data communications terminals. This hardware completely eliminates manual transmission and the leased lines.

Then, Wittek transmits data at 1,200 bit/sec over voice-grade Wats lines. They have two end-to-end magnetic tape buffers, one to send traffic and one to receive traffic.

Each buffer is a 50,000-character storage capacity. Along with the two buffers, the terminals contain a communications control unit and an internal modem, Gore noted.

Although there are 24 locations, System 99 utilizes 41 terminals. These include auxiliary units used at high-volume locations.

This is possible because the communications control unit can interface up to eight auxiliary buffers, he explained. The auxiliary buffers utilize not only the main communications control unit but also the modem and data access arrangement (DMA) of the master terminals.

The Wittek terminals are controlled via an Action Communications Systems, Inc. message switch which accesses the units through three Wats bands. This message switch is connected through magnetic tape to the central processing unit. In this way, master files are accessed and updated daily without keypunching.

Using the terminal network, System 99 transmits administrative messages and freight bills. The daily total of freight bills alone is 1.3 million characters and this volume is expected to grow to over two million characters, Gore said.

The raw data for the freight bills is a bill



Central billing office at System 99 trucking firm includes Wittek terminals and Action Communications Systems message switch.

of lading from the customer. This information is sent to the central billing location. There are six billing locations. At the billing locations, charges are figured and a freight bill is created.

The freight bills first are prepared on the Model 400 units. All the information typed on the bills is transferred to the terminal's send buffer for storage until the terminal calls the terminal to initiate data transmission.

At the time of transmission, freight bill data is logged on tape in the message switch while being forwarded to the destination location. The message switch tape is transferred daily to the CPU so that the master file can be continually updated.

At the destination location, the formatted freight bills are automatically printed out at 30 char/sec, ready to be signed upon delivery of the shipment.

Using the system, the night billing operation can be completed by 3 a.m. This reduces a time savings of one-and-a-half hours over the old system. Among the major objectives Gore feels the communications network has achieved are:

- Bisynchronous communications which reduces transmission error rates.
- Enhanced information retrieval and transmission capabilities due to the terminal buffers.
- The ability to capture all the information on magnetic tape and input to the CPU without keypunch.
- Fast information turnaround. Invoices are prepared two days sooner.

## TROUBLE SHOOTING

QUANTRA PROVIDES SERVICE ANYWHERE: IN

- DATA ENTRY SYSTEMS
- ON LINE SYSTEMS (INCL CICS)
- RECOVERY TECHNIQUES
- PRODUCTIVITY TRACKING AND ANALYSIS
- SYSTEM GENERATIONS
- TELECOMMUNICATIONS
- DATA BASE MGT

FOR RAPID HELP, CALL GENE PRIMOFF, TEL: 914-235-1139

QUANTRA DEVELOPMENT CORP. (founded 1970)  
15 Whithfield Terrace, New Rochelle, N.Y. 10801

# SYSTEMS & PERIPHERALS

## Bits & Pieces

### Gould Interfaces Plotters To Three Univac 1100 CPUs

NEWTON, Mass. — Gould, Inc. is offering a controller called Univac 1100 to interface its 4820 and 5000 series electrostatic printer/plotters with Univac 1107, 1108 and 1110 computers.

With the controller, the Gould printer/plotters can receive electronic data at the rate of 3,000 lines/min. and plot graphic material up to 75 sq in./sec., according to Gould.

The standard 110X controller requires one Univac channel and can handle as many as 14 Gould plotters.

Input-output protocol uses Univac's arbitrary device handler, and software is provided through Gould's hardware print and plot package.

The 110X is priced at \$6,900, with delivery in 60 days from 20 Onsite Read, 62164.

### Career Hold S/3 Cards

LOS ANGELES — Beemak Plastics is offering punch card carriers designed to protect IBM System/3 cards that travel with materials through a manufacturing process.

The rigid polyethylene card-holders are designed to hold up to 15 cards.

In quantities of 1,000, the price is 20 cents per carrier, with larger quantity discounts available.

The company is at 7424 Santa Monica Blvd., 90046.

### Bar-Coded Labels Verified

DAYTON, Ohio — The printing accuracy of bar-coded tags and labels can be verified with the Model 2352 verifier from DataMark Systems, Inc.

As the operator passes the beam of the light pen across the bars of code, the scanner reads the encoded information and displays it in readable form. When large quantities of bar-coded tags and labels are imprinted, spot checks can be made by using the tag verification feature.

The price of the Model 2352 verifier is \$1,770. The firm can be reached through P.O. Box 608, 44401.

### CMI Up Lease, Purchase Prices For 370/Stor Memory Systems

BEDFORD, Mass. — Cambridge Memories, Inc. will increase lease and purchase prices on its line of 370/Stor computer memory systems from 6% to 8% effective Nov. 1.

Lease prices on the 370/Stor 145 system will be increased to a range of 85¢/hr. Lease prices on 370/Stor 155 and 165 systems will be increased 6%.

Purchase prices for all three systems will be increased 6% and maintenance rates will be increased 8%, the company said.

## HP Packs 192K on 21MX Minicomputer

By Vic Farmer  
of the CW Staff

PALO ALTO, Calif. — Using a dynamic mapping memory management scheme and 4K random-access memory (RAM), Hewlett-Packard has packed 192K of semiconductor memory into a 17-1/2 in. high 21MX minicomputer system with a specific cycle time, according to HP.

The HP Dynamic Mapping System (DMS) functions with main memory somewhat as "virtual memory" schemes function with disk memory, HP said. DMS locates main memory dynamically under memory protection, giving

The scheme expands the address space from 15 bits to 20 bits and can therefore manage a 1-Mword memory. The most significant five bits of the standard 15-bit address bus are used to select one of 32 high-speed registers in the DMS hardware. Each register points to one of a possible

1K pages (each of 1K 16-bit words) and also provides two bits of read/write information for each page.

There are four independent and dynamically alterable 32-register blocks the "maps" of DMS. Two maps configure memory for program execution (one for the system and one for the user) and two are assigned to the Dual Channel Port Controller for direct memory access operation.

By structuring the processor with separate buses for data and addressing, and using high-speed microcoded routines, the translation done by the DMS is completely transparent to the memory cycle, which preserves a 650 nsec cycle time, HP said.

The DMS firmware includes 25 new microcoded instructions, including cross map moves and block transfers, to give

extensive control over memory allocation and read/write protections, HP claimed.

The user can add his own unique memory management and protection instructions to optimize his particular system design, the company added.

In addition, the 25 instructions give read/write protection on an individual 1K page basis and error handling.

Although the 21MX minicomputers were previously limited to users purchasing five or more [CW, May 11], HP has eliminated this restriction because there are now adequate restrictions of the 4K RAM chip market, the company said.

The 21MX Series offers microprogrammable parity, floating point, extended arithmetic unit and a "brownout-proof" power supply.

The smallest processor/mainframe, the 5-1/4-in. high M/10 (previously called the 2108) with 16K words of memory, is priced at \$7,900. The M/20 (previously called the 2108), with 32K words and a microprogrammable processor, is priced at \$14,000.

HP said no further controllers are needed to increase memory size. The 12-1/2-in. high Memory Extender Chassis (MEC), has a capacity for eight 16K-word memory boards.

The maximum size 21MX presently available consists of this MEC and a 64K-word M/20 processor for a total of \$20,900. The M/20 has a list price of \$66,600. But HP has also hinted that units with a 1M-word memory can be purchased.

HP is at 1501 Page Mill Road, 94304.

### Vendor Aid, Flame-Proof Vault Get Bank Going 2 Days After Fire

MICHIGAN CITY, Ind. — Quick service from its vendor and good protection for its tapes enabled the Citizens Bank here to get back to business just two days after a major fire.

The fire began on a Wednesday during banking hours, destroying over 6,500 square feet of the bank. Flames spread to the computer, commercial loan and storage departments, files and the proof department, which is operationally termed the "core" of the bank.

Included was equipment housing the magnetic tapes which contain master records of checking and savings account deposits, balances and other transaction records.

"Within the following morning before the fire was extinguished," reported Robert Cleveland, vice-president and cashier, "anyone looking at the bank at that time would have been justified in estimating that it would be weeks before we could even determine the loss. Our IBM 360/20 computer had been completely destroyed and the vault housing our tapes was in the debris of one of the rooms that had been swept by fire."

Yet the Citizens Bank was processing its tapes on a new computer system by Friday, just two days after the event.

Cleveland attributed the rapid recovery to two factors. For one thing, IBM, by drawing upon equipment from various parts of the country, was able to replace the 360/20 within 48 hours, installing and testing the system at a temporary location.

For another, the tapes emerged unscathed from the fire. They had been housed in a Wright Line Data-Bank safe

which was designed and constructed specifically to protect magnetic media.

The recovery of these records in immediately usable form was important not only to the regular day-to-day deposit accounting, but also to our standing as a reliable supplier of investment company firms and organizations in the community," Cleveland said. "The inventory and payrolls of local companies, the United Fund records, the label printing — all were operational by Friday."

SAN LEANDRO, Calif. — A small calculator-type keyboard with a seven-segment LED octal display performs remotely all of the standard functions of Digital Equipment's PDP-8/E computer's programmer's console, according to the manufacturer, Douglas Electronics, Inc.

Current memory address and selected register contents can be continuously displayed on the RFP-80. Choice of display, data entry and various instructions are accomplished by keyboard operation. The display and keyboard operate in octal, the company said.

The package includes the bus plug-in interface circuit board, 10-foot interconnecting cables and a plastic front panel replacement for the PDP-8/E front panel with a cut-out for the display module. A PDP-8/E instruction set is printed on the bottom of the 3 in. by 6-in. by 1-1/2 in. hand unit.

Any number of remote RFP-80s can be connected to a central minicomputer, the company said. Extra long cables to link these remote stations are available on special order.

The RFP-80 package price is \$700 from the firm at 718 Marina Blvd., 94577.

### Remote Keyboard Runs PDP-8/E

The maximum size 21MX presently available consists of this MEC and a 64K-word M/20 processor for a total of \$20,900. The M/20 has a list price of \$66,600. But HP has also hinted that units with a 1M-word memory can be purchased.

HP is at 1501 Page Mill Road, 94304.



RFP-80 Remote PDP-8/E Panel

talk is cheap

SPEED	80 to 200 lpm
COLUMNS	100 to 800 cps
BAUD RATES	80 or 132
	110 to 9600

CENTRONICS

## For DEC's PDP-11/45

### Buffer Has 450 Nsec MOS Speed

MNNEAPOLIS — Fabri-Tek, Inc. has introduced a high-speed memory enhancement, the Model 4511 memory buffer, for Digital Equipment Corp.'s PDP-11/45.

### Pertec Tape Transport IBM-, Ansi-Compatible

CHATSWORTH, Calif. — A 10-1/2 in. reel-to-reel column tape transport from Pertec Corp. is IBM- and ANSI-compatible. The transport is available with tape speeds from 25- to 75 in./sec. and data transfer rates up to 120 kchar/sec.

Pertec said the transport has an anti-tensioning system to minimize tape wear. Standard configurations for the tape drive include 7- or 9-track NRZI, 1,600 char/in. phase-encoded (PE) or an optional electronically switched dual-format NRZI/PE.

An edit feature allows selective updating of pre-recorded tapes.

Single unit price is \$4,715 from Pertec at 9600 Irontdale Ave., 91311.

### Paper Tape Readers Work With IMP Micros

CANOGA PARK, Calif. — Icom, Inc. has developed a paper tape reader, the R8016P, for direct interface with National Semiconductor microcomputer models IMP-8P and IMP-16P.

Sale will be eight times faster than a standard reader. The unit has plug compatibility with a micro's card reader interface, compatible software and a photoelectric character detector.

Assembler program loading is less than 2 minutes per firm said. Software for the R8016P reader is supplied on paper tape which is loaded into customer-supplied programmable read-only memory (Prom) with optional loaded Proms available.

The unit is priced at \$995 from the firm at 6741 Varied Ave., 91303.

### Disk Cartridge Controller Plugs Into PDP-8's Omnibus

BERKELEY, Calif. — Data Systems Design, Inc. has introduced the DDC-Digital Equipment Corp.'s PDP-8 and PDP-11's has a controller that plugs directly into the PDP-8 Omnibus or mounts inside a PDP-11 as a system unit.

The system provides access to up to eight disks, with 400M bits of data storage.

The company also said any format and preamble may be read or written under program control, and a single instruction permits the user to transfer large files in block format without maintaining intermediate formats or addresses.

Price for the PDP-8 model is \$3,600, and for the 11, \$3,900. The firm is at 1122 University Ave., 94902.

### T1 Puts Service On-Line

HOUSTON — Texas Instruments (TI) has gone on-line with Ti-Care, a remote computer diagnostic and dispatching service for customers with T1 computer equipment and systems.

The service provides a single point of contact for customers with multilocation installations, according to the company.

Using direct distance dial phone lines it enables computerized dispatching and real-time tracking of all calls. Each call is logged into the computer with status reports generated at specified intervals until the call is completed.

To date, the company reported, approximately 30% of the calls are cleared without dispatching a customer service engineer.

## Books and Brochures

### Report Analyzes Tradeoffs of Implementing Mini System

*Issues Involved in Implementing a Data Processing System on a Minicomputer*, by Ronald Barry Freeman, Document No. AD-782 250/5WC, National Technical Information Service, 5285 Port Royal Rd., Springfield, Va. 22161. 229 pages, \$6.00; microfiche, \$1.45.

This report analyzes various tradeoffs and questions and offers possible compromises and solutions for software, hardware and the human factors considerations.

Author Ronald Freeman of the Wharton School of Finance and Commerce at the University of Pennsylvania, has included an instruction manual for a data processing system he designed for the U.S. Navy.

This particular system, which automates

the logistics control and report-generating functions of the supply department for many Navy ships, exemplifies the use of minicomputers in DP systems.

#### Mini as Engineer Evaluated

*Minicomputer (Tecmat)*, by John P. Francis, Document No. AD-782 943/5WC, National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161. 61 pages, \$6.25; microfiche, \$1.45.

This is an engineering evaluation of the effectiveness of a minicomputer system in management and engineering problems.

The minicomputer is a small off-the-shelf disk system. The central processor is a 6800 with 64K core memory and an additional Line model 600 magnetic mass memory. The data terminal is a Texas Instrument Silent 700 keyboard printer with a writing rate of 30 char/sec. Also included is a Remex high-speed paper tape reader.



**INCOTERM<sup>®</sup>**  
CORPORATION

6 Strafford Road  
Natick, Massachusetts 01760  
(617) 655-6100

## Reduces Inventory

# User's Small System 'Paints' Best Production Picture

UPLAND, Calif. — The production controller at Pactiv Industries here doesn't have to spend a lot of time figuring out the best production sequence for his company's products. The firm's small business computer does the job for him.

The task is particularly important at Pactiv, a small paints and hobby supplies manufacturer, since the order in which paints are produced can have a big effect on clean-up time, noted Leo Leonard, who runs both plant production and DP manager.

Pactiv employs about 100 people, occupies a 70,000 sq-ft plant and generates \$7.5 million in annual sales from a product line of about 1,500 items.

Production control starts with inventory and production control systems that starts with three CRTs that key data from sales invoices into a Basic/Four Model 400 CPU.

The configuration includes a 4.2M byte high-density disk drive and a Model 350 medium-speed matrix head printer.

### Reduces Inventory

The system uses this data to reduce the inventory of finished goods and to print out a general stock status report twice weekly.

To complement this, the system prints out a more timely exception report on a daily basis and runs it quarterly for newly-entered orders.

The inventory control manager then evaluates the reports and orders production runs. The computer can print out the number of units needed to get stocks down to a certain level, the amount and kind of raw materials needed, and the unit cost of a product.

These documents go on to the firm's purchasing agent.

Before the actual production run, the controller can randomly key in production orders for any one size of spray paint can.

The computer then sorts the product by propellant, type of valve and paint sequence and comes up with a document listing the most efficient way to run all the orders the controller has keyed in.

However, if the firm has back orders or other exceptions, the controller bypasses this step.

This document, which goes on to the machine operator at the filling machines, also indicates when a valve is to be changed and what ingredients are to be used to cut down on costly oversights.

The production staff returns a document daily on what they have produced, what materials they have used and other data. This is keyed into the system and

updates the finished good master file and the raw material file, Leonard said.

Leonard, who did the programming for the system himself, said Pactiv acquired the computer in 1972 because its unit and equipment was hard put to keep up with the company's growing workload.

That system's results were neither as timely nor as sophisticated as what we're doing now," he added.

With the new system, Pactiv has added a third display. With its displays the system had cost \$1,000/mo on a lease/purchase plan, Leonard said.

This was virtually the same as the unit record system's cost, he added.

## Post Office a Long Way From the Pony Express

WASHINGTON, D.C. — An RCA-developed automated system is facilitating U.S. Postal Service window operations in a pilot program at three San Jose, Calif., locations.

The data management system, designated by the Postal Service as Point of Sale/Terminal (Post), allows clerks in retail postal consolidations such as stamp, parcel post and money orders and provides up-to-the-minute accounting information.

The system's stand-alone terminal features a microprocessor, a special function keyboard and a 5-in. CRT display. In addition, a bulk-in card reader and printer are employed.

When conducting a transaction for a customer, the postal clerk uses the keyboard to insert information into the system. The type of transaction, charges involved, money received and change due the customer are computed and displayed on the screen.

Two paper copies of the data, one for the customer, the other for Postal Service records, are printed. The system also records the transaction on cassette tape for later processing.

## Tape Standard Proposed For Bibliographic Data

WASHINGTON, D.C. — A proposed standard for bibliographic information interchange on magnetic tape is being coordinated with federal departments and agencies, state and local governments, industry and the public by the Commerce Department's National Bureau of Standards.

This standard, which is the adoption of a voluntary industry standard developed by the American National Standards Institute, prescribes a format for the interchange of bibliographic data. It will be used for formulation and storage of records on magnetic tape used to interchange bibliographic information between a variety of data processing systems.

Federal procurement will cite the standard whenever the results of such contracts are in the form of recorded bibliographic records on magnetic tape.

Copies of the proposed standard are available from the Office of ADP Standards Management, Institute for Computer Sciences and Technology, NBS, 20234.

## Note That Card!

WYNDMOOR, Pa. — The Pennsylvania Pacific Corp. now offers plastic containers designed to accommodate 80-column punch cards.

The Model 1812, measuring 18 in. by 12 in. by 6 in., is priced at \$12.95. The Model 1515, at 20-1/2 in. by 15 in. by 6 in., sells for \$16.45. The company is at 805 E. Willow Grove Ave., 19118.

## Why Crime Pays Less Than Ever In Lake County, Illinois:

### INCOTERM<sup>®</sup>

In an inflationary economy, it's nice to see someone holding the line on the wages of sin.

That's what they're doing at the Lake County Sheriff's Office. With a little help from INCOTERM.

A powerful INCOTERM SPD/10/20 Intelligent Display terminal serves as controller for 50-odd mobile teleprinters in local and county police cars covering nearly 500 square miles of northern Illinois.

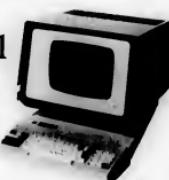
The officers on the road call in verbal reports and queries; they get hard-copy responses right in the cruisers. For the first time, police can receive such transmissions with no risk of unauthorized interception.

At the other end, INCOTERM ties into the Illinois LEADS system in Springfield, to access the state's fast-growing criminal data bank...about crimes, about vehicles, about stolen property, about guns. Through INCOTERM, the officer on the street can also communicate with law enforcement agencies in surrounding states—Wisconsin, Ohio, Indiana, Kentucky—over the high-speed lines of the new ALECS system. And INCOTERM also ties him into the NCIC system of the FBI.

Even if a suspect is seated in the cruiser beside the officer when the return message comes in, INCOTERM screens the information in the station house first to permit the encoding of data critical to the officer's safety.

And it does all this while cutting typical transmission times in half. Plus...the built-in INCOTERM memory lets the officer in the car interrupt incoming messages for emergency voice transmission—without missing a word.

### INCOTERM: More Power To Your Terminal





**IBM 360/195  
FOR ONLY  
50¢ a SECOND**

**COMPARE  
REQUEST A BENCHMARK**

**Guaranteed Turnaround**

**2 megs; 2314's —  
330's — 3420's**

**OS / MVT**

**HASP/RJE**

MPPX - PPSS - PMS - SSP - C3-MP  
And Other Fortran G, 61, R, Numerical  
F, I, M, P, T, PL/I, Optimizing and  
Character Converters.

Our typical customer is headquartered  
in a small town with a population of 10,000.  
ICL, Olivetti and the像 of the  
computers/assemblers to use. Useful  
data: 27000+ jobs per month, 200 customers  
and 1000+ users familiar with its opera-  
tion and that of HASP/RJE.

Call or Write

**UNITED AIRLINES**

Computer Services Division W

Davidson, Director of Computer Services

5350 So. Vallecito Way

Eugene, Colorado 80110

Tel: (303) 458-4000

San Francisco (415) 878-4022



**TWX/DAA MODEM**

**MODEL 4500-OMNI-DATX**

Originate/answer & auto-answer Bell 101C compatible modem with TWX functions to interface with TWX/TAA. Optional switch box to allow either TAA or DAA use.

**OMNITEC CORPORATION**



2405 S. 20th Street  
Phoenix, Arizona 85034  
(602) 258-8246

**Now you can measure  
damn near everything**

Hundreds of DP operations have been using CUE to evaluate the overall hardware performance of their systems by measuring the execution activity of all channels and devices.

Even more operations have been using PPE to pinpoint high activity areas of specific applications.

Now we've filled the gap with TSA (Total System Analyzer).

TSA is a total system and program module activity monitor and produces summaries to help you analyze high activity areas over a period of time. The PPE portion of TSA then pinpoints high activity or wait problem areas back to specific addresses in your programs or system modules to pinpoint system performance.

TSA is a dramatic step forward in system and program management. Since PPE is now part of TSA, if you are a present PPE user we'll give you 100% credit for PPE toward the purchase of TSA. Through December 31, 1974.

suffers the inaccuracies and de-  
lays inherent in a manual sys-  
tem.

There are two basic approaches for on-line collection of data for a manufacturing management information system: remote data entry terminals and a sensor-based production monitoring system.

**Remote Data Entry**

The first approach is the re-  
placement of a limited number of data entry terminals, linked to a computer, at centralized locations on the plant floor. The data entry terminals vary from CRT terminals and teletypewriters to card and badge readers with the additional capability of entering variable coded data.

The obvious benefit of this ap-  
proach is that variable and com-  
plex as well as fixed data can be  
transmitted directly from the  
plant floor to the computer for  
further processing.

The type of computer and system utilized varies; depending  
on the application, from stand-  
alone dedicated computers which  
may be interconnected with  
host large-scale computers to a  
large-scale computer performing the  
data acquisition function on a  
time-shared basis.

This approach is most suitable  
for assembly line applications because the information required is concerned  
with tracking the progress of each subassembly or part as it  
moves from station to station.

In a job shop environment  
where jobs are typically short-  
run, the data entry terminal be-  
comes a direct replacement for  
the manual recording of job in-  
formation of varied complexity.

The automatic collection of  
data entered at the location  
and source of a job includes  
management with current information  
necessary to evaluate the actual performance against  
schedules and make the assign-  
ment of job priorities. The ter-  
minal may also similarly be used  
to collect data for labor reporting.  
It is important to note that, in  
many cases, although the data is  
collected automatically as the  
transaction takes place, the in-  
formation is collected in batches  
on a batch basis in order to  
update files and provide reports  
on the previous day's activity.

**Sensor-Based System**

The second approach, a sensor-  
based production monitoring

system, provides a means of col-  
lecting vital production informa-  
tion on piece count, runtime and  
downtime directly from the in-  
dividual machine.

The system utilizes a work sta-  
tion terminal in a fixed  
monitored position. The terminal automatically collects  
production count from physical  
sensors tied into the monitored  
machine, while at the same time  
providing a vehicle by which  
the operator or manager can keep  
the system aware of the operational  
status of their machines.

One benefit of this approach is  
that production count and ma-  
chine/operator status information  
can be collected simultaneously  
with actual job performance and  
without requiring the operator to  
leave his work area or become  
his own timekeeper/keypunch  
operator.

This second approach is ideal  
for production plants manufac-  
turing discrete parts since man-  
agement in these plants must be  
aware of substandard perfor-  
mance or problems either as they  
arise or in summary reports.

**Hybrid Approach**

It is obvious that manufacturing  
operations do not necessarily fit  
neatly into the categories  
described and therefore may  
require a hybrid solution that is a  
hybrid of the two approaches.

An example would be an assem-  
bly plant which manufactures  
discrete parts required by the  
assembly departments. An  
ideal system in this situation  
would be a sensor-based production  
monitoring system in the  
feeder departments and assembly  
departments complemented

by a limited number of remote  
data entry terminals.

The work station terminals  
could be utilized to monitor the  
machines and the assembly lines,  
keeping management abreast of  
their status and productivity.

Dubner is vice-president of the  
Information Automation Co.

**Arkansas Raft Race  
Joins Wave of Future**

TULSA, Okla. — It will prob-  
ably be called the Great Com-  
puter Raft Race after this year.  
Tulsa's annual race down the  
Arkansas River this year had  
more rafts, more captains and  
more spectators than ever.

Because of the different raft  
categories and difficulties in re-  
cording start and finish times, it  
took nearly three days to get the  
final race results last year.

This year, a large number of rafts

and starting times were entered  
into the system and the com-  
puter kept a running track of the  
best elapsed times.

The results were known

an hour after the race, and the  
system is scheduled to be used  
again next year.

	<b>VOLUME KEY PUNCHING (402) 346-0330</b>
	<b>"JUST MINUTES AWAY"</b>
<b>AMERICAN KEY PUNCH</b>	<b>Radios Tower Omaha, Nebraska 68102 and Ft. Worth, Texas</b>

<b>145</b>	<b>SALE 155 W/DAT LEASE 165</b>
	<b>Computer Marketing Inc.</b> (215) 695-6112 7704 Bunting Ave., Malvern Park, Pa. 19126



<b>I'd like to find out why my system isn't responding. Send me information on TSA so I can measure the downside thing.</b>	
<input checked="" type="checkbox"/> I'm a present PPE user.	<input type="checkbox"/> Also tell me about CUE.
Name _____	State _____
Company _____	Phone _____
City _____	Zip _____
<b>Books &amp; Periodicals</b>	
2000 El Camino Drive, Sunnyvale, California 94086 (408) 736-2200	

# Of course you should.

The EDP Seminar Series gives you the information you need to keep ahead of this fast-changing industry.

We've selected leading experts from around the country to give seminars on some of the most important topics in the EDP world. These seminars are current, practically oriented, and packed with dense information. They will help you save time and money. And they can give you the information you need to increase your business's efficiency. In an increasingly complex and fast-changing EDP world, these seminars are even more important to your company, your installer, and you. Here is our current seminar schedule:

## Data Communications

Includes SDLC, HD-LoD, and other topics that weren't even heard of a year ago.

Data Communications is a complicated and rapidly changing field. And this seminar will give you the information you need to keep on top of the subject. Led by the nationally recognized Roy N. Freed, Dr. Dixon Doss, the course covers recent changes in areas like SDLC, HD-LoD, DDS, newly approved major revisions to WATS, and the impact of satellite carriers and specialized carriers.

The course will also cover general data communications topics, including intelligent terminals (performance and selection criteria), network software handlers (e.g. CICS) and network organization and design. And, you'll learn about saving money using such innovative concepts as multiplexers, remotes, multiplexers/concentrators, diagnostics for fault isolation and front-end processors.

All participants in this seminar will receive a 2-volume loose-leaf outline of all course materials (prepared by ICC Institute), a copy of "Data Modems Selection and Evaluation Guide" by Vass V. Vilpis and a "Data Communications and Teleprocessing Dictionary".

You should attend this seminar if you are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field — or if you are considering entering the field in the future.

This seminar runs two days, and totals 16 hours. Including workbook, reference materials, luncheons and continental breakfasts is \$350. Additional registrations from the same company qualify for a reduced rate of \$300. Current schedule is as follows:

**Chicago** Hyatt Regency O'Hare November 4-5  
**Miami** Miami Marriott December 2-3

## Contracting for Computers and EDP Support Services

A seminar that can help you protect your EDP investment — and your systems.

In an industry that's famous for its "promise them anything" attitude, you need good, effective contracts from the vendors that supply your installation. And this seminar gives you the information you need to get them. It will show you how to protect your installation from late deliveries, inaccurate equipment or services and the costly disruptions that they can cause.

Course topics include the standard purchase of computer systems; separate hardware and software — including time sharing, data processing services and consultation — and the use of facilities management.

Under the personal instruction of Roy N. Freed, a nationally known lawyer, author and expert in the field of computer law, you'll learn how to place yourself in a strong bargaining position, how to insure on-time delivery of exactly what you want, how to set reasonable performance standards and how to protect your investment as much as possible. You'll also receive a complete resource notebook, including sample vendor contract forms.

You should attend this seminar if you are involved in the purchase of EDP equipment or services, whether as a corporate counsel, contract administrator, DP manager, consultant or officer of a firm.

Cost for the entire 2½ day seminar, including complete resource notebook, continental breakfasts, luncheons and coffee break is \$295.00. The current schedule:

**New York** St. Moritz October 23-25  
**Chicago** Hyatt Regency O'Hare December 4-6

## Key-To-Disk Systems

How to evaluate and optimize the most common successor to keypunch equipment. Data entry is a big problem — and a big headache — as every computer user knows. And key-to-disk systems are the most popular methods of improving efficiency in this area. So this course is designed to help you learn the practical aspects of selecting, installing and making the best use of key-to-disk. Topics include:

- key-to-disk hardware and software.
- starting a key-to-disk system.
- data entry system design.
- data entry system selection.
- interfacing key-to-disk terminal.
- operating a small key-to-disk system.
- improving productivity.
- trends in computer data entry — including multi-media.

This seminar is lead by Lawrence Feldman, President of Management Information Corporation, and one of America's leading experts on data entry. All participants will receive a copy of "Data Entry Today", Management Information Corporation's authoritative publication on every aspect of data entry.

You should attend this seminar if you are considering (or currently using) key-to-disk systems. Cost for the 3-day seminar is \$350, including continental breakfasts, luncheons and all course materials. Additional registrations from the same company are charged only \$300.

Current schedule:  
**New York City** Waldorf Astoria November 11-13

## Data Base Management

A practical approach to the design and implementation of data base systems.

The difference between an effective data base system and a waste of computer time and memory is in effective planning, system selection and management. And this course gives you both the information and the basic experience you need for a proper design and implementation of a data base system.

Given in association with Leo J. Cohen and Performance Development Corporation, this course covers a comprehensive list of topics, including:

- the description and definition of the Data Base System Project.
- the development of a full-service analysis and system design.
- optimization of data collection and indexing techniques.
- a wide range of indexing techniques and their implementation.
- all aspects of system management.
- and much more.

One of the key features of this course is the workshops, in which you'll apply what you've learned. And before you're finished you'll have "done" a complete, on-line order entry/inventory management system.

You should attend this seminar if you are (or will be) involved in the design and implementation of a data base system — whether as a DP Manager, Data Base Administrator, Planner, Analyst or Programmer.

This course runs for 3 days, and costs \$350. Including course materials, continental breakfasts and luncheons. Additional registrations from the same company qualify for a reduced rate of \$300.

Current schedule:  
**Chicago** Playboy Towers November 18-20  
**Denver** Denver Hilton December 9-11

## How to Draft Effective Legal Agreements Relating to Computer Technology

A one-day workshop for non-legal technical people

For a variety of reasons, computer users and computer manufacturers often use non-legal people to draft agreements. These agreements are used for specific transactions and as "standard forms", and they can cause significant problems. It's easy to overlook important legal points — especially in a non-legal context — and this workshop is designed to give you the basic knowledge you need to avoid the pitfalls.

Conducted by Roy N. Freed, course leader of our comprehensive contracting seminar, the workshop includes the following topics: Purpose and functions of formal agreements; architecture of agreements; language cavats; use of forms; checklists and outlines; suggested writing style; sources of applicable legal rules; sources of assistance; and more.

Cost of the workshop, including resource notebook and lunch is \$135. Current schedule:  
**Boston** Sheraton Boston November 20th



To: Ed Bride, Vice President, Editorial Services, Computerworld  
797 Washington Street, Newton, Mass. 02160

Please send me a brochure and registration form for the following seminar(s):

Title \_\_\_\_\_

City in which you would  
probably attend.  
\_\_\_\_\_  
\_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (\_\_\_\_\_) \_\_\_\_\_

NOTE: If time is short, you may reserve space at any seminar by calling collect. Call Marcia Hewett at (617) 965-5800.

**If you can read this  
you can operate  
Microdata's new  
computer system.**

**That's Reality.**



Finally, there's an information management system so easy to operate anyone can use it. We call it REALITY™.

REALITY is a powerful, low-cost system designed for a wide variety of applications such as inventory control, production control and general accounting.

REALITY is easy to use because the user communicates with it in a remarkable computer language

called ENGLISH.™ You're reading it right now. It's a Microdata exclusive.

REALITY is simple on the outside, powerful on the inside. It operates on-line in RPG II. So if you're currently using a System/3, REALITY is compatible with your present programming.

Because REALITY combines the hardware and software (we call it firmware), it can handle multiple users and terminals while still providing substantially faster response than large scale data processing machines. Another REALITY exclusive—a single corrective entry will automatically update all related records in a single chain reaction sequence.

Face REALITY. If you're interested in multiple systems, call Microdata at 714/540-6730 for a demonstration in your office. Or write for descriptive literature. Microdata Corporation, 17481 Red Hill Avenue, Irvine, California 92705.



**Microdata**

# COMPUTER INDUSTRY

## CI Notes

### STC to Supply CI, Siemens

LOUISVILLE, Colo. — Storage Technology Corp. has signed a purchase order agreement with Siemens Corp. and Compagno's International to supply a "1-line" cassette for about \$14 million worth of tape systems. Volume shipments of the models 3630, 3640, 3650 and 3670 tape drives, as well as the 3800 model 4 control unit, will begin in 1976.

### IBM Office Monopoly Charged

NEW YORK — In addition to facing several antitrust suits in the computer area, IBM now has on its hands a complaint filed by Eaton Allen Corp., maker of typewriter ribbons, charging it with monopoly practices.

The complainant, filed in U.S. District Court here, charged that IBM's manufacture of correction material has deprived Eaton of its \$40 million share of a \$100 million market in this area. Eaton is asking for treble damages and an end to IBM's alleged monopoly in the field.

### Univac 90/30 Hits 100

BALTIMORE, Md. — Worldwide sales for the Univac 90/30 computer system have passed the 100 mark in the three months since its introduction, according to Frank B. Holst, Univac's director of program management.

About half of the orders were received from the U.S. and the bulk of the remainder from European countries and Japan, he said.

### Supershorts

Optical Scanning Corp. will market and service Infoton, Inc.'s line of CRT terminals for the end-user market. Infoton will continue to sell to the OEM market.

Printer maker Quime Corp. has named C. Itoh and Co., Ltd. as its Far East distributor and has assigned manufacturing rights to the firm.

Decision Data Computer Corp. has appointed Compania Nacional de Computacion, S.A. as its distributor in Venezuela.

Xebec Systems Inc.'s Alphabec 70 pen that allows direct entry of hand-printed data has been named one of the 100 most significant technical products of the year by Industrial Research, Inc. The pen was developed at Stanford Research Institute.

### Clarification

Leeds & Northrup's Electronic Instrumentation Division is negotiating a standard OEM contract to supply Victor Associates with ADM-1 and ADM-2 terminals [CW, Oct. 2].

## Commerce Reports

# Japan DP Imports to Hit \$1 Billion by '77

By CW Staff Writer

WASHINGTON, D.C. — Japan's imports of digital equipment will grow at an annual rate of 30% through 1977, when they should exceed \$1 billion, according to the Dept. of Commerce.

The U.S. share of the rapidly growing market should remain constant at about 55% through this period, although that is down from the 70% high attained in 1971, when all DP imports totaled \$274 million.

In 1974, Japanese DP imports should reach \$566 million, Commerce's *Market Digest* said.

The total Japanese market is expected to average an annual growth rate of 43% through 1977, when annual sales should exceed \$10.7 billion from the 1972 base of \$1.8 billion.

Japanese production of computers and related equipment has doubled every two years since 1964 and totaled about \$1.5 billion in 1972, according to the report. Local production supplied 83% of the total market in 1972, while internationalization increased and increased the company's level of imports, Commerce noted.

### Mini Blazing

One of the fastest growing segments of the Japanese market is the minicomputer market, which is likely to show an average annual growth rate through 1977, when sales of both domestic and imported machines should top \$6.30 million.

The market for small, medium and large systems, which nearly doubled between 1970 and 1972 when it stood at \$934 million, should attain an annual growth rate of 39%, resulting in sales of over \$4.8 billion in 1977.

Total imports of digital computers jumped from 4,522 units with a value of \$63.1 million in 1970 to a projected 13,826 units in 1973 with a value of \$105.2 million.

The U.S. share totaled 3,033 units or \$56.2 million in 1970 and 2,537 units or \$68.2 million in 1973.

Independent peripheral sales in Japan are expected to rise at a 44% annual rate, reaching \$4.3 billion by 1979, according to the report. In 1974, the independent market is estimated to reach \$1.4 billion.

Imports of U.S. and JIO devices totaled 35,793 units for a value of \$116.7 million in 1970 and 95,052 units or \$164.4 million in 1973.

The U.S. contributed 26,341 units with a value of \$80 million in 1970, while in 1973 shipments were 52,596 units with a value of \$98.2 million.

Use of on-line peripheral equipment is expected to grow from 1974 to 1976 from 15,000 to 152,000 units compared with the 44,110 units in use at the end of fiscal 1972, according to the Japan Electronic Industry Development Association.

The market for U.S.-made communications terminals should expand since these are considered technologically superior to those made in Japan, the report noted.

### Other Markets

Other peripherals for which there are "highly favorable sales prospects" are high-speed printers, magnetic tape systems, CRT inquiry response terminals, document readers, disk drives, plotters and converters.

Marketing opportunities for key-to-

tape/disk terminals are "outstanding," particularly for those with a 128-character Katakana set, the report said.

Another emerging area is that of read-only memory devices.

The market for data transmission equipment is projected to grow to more than \$1 billion at 1974 market level by 1977, reaching \$845 million.

Fixed-program and stored-program processors as well as concentrators also should find good market acceptance, the report said.

## IBM 3d-Period Earnings Up 16%, While Burroughs Records 22% Hike

Third-quarter reports at IBM and Burroughs Corp. continued the record setting patterns established earlier, although IBM's third-period income gain of 16% was off the 31% pace set in the first half. IBM's 1974 sales rose more than 10%.

IBM Chairman Frank T. Cary cited a decline in the proportion of outright sales on DP equipment compared with the first and second quarters. He warned that the margin of growth for the rest of 1974 will likely be slower than in the first half because of the strong 1973 fourth quarter.

Burroughs reported a blazing 27% rise in nine-month operating earnings with revenues up 18% compared with the same 1973 period.

At IBM, third-quarter earnings rose to \$477.3 million or \$3.23 a share from \$409.9 million or \$2.81 a share a year ago.

Revenues reached a record \$3.12 billion from \$2.76 billion in the same 1973 quarter.

### Nine Months

For the nine months, IBM earnings jumped almost 26% to \$1.39 billion or \$9.45 a share from \$1.11 billion or \$7.59 a share. Revenues rose 21% to \$9.39 billion from \$7.75 billion in the year-ago period.

In the first quarter, IBM earnings rose 27% and revenues almost 23% compared with year-ago figures, while in the second quarter earnings soared 33% with revenues up 28%.

The third-quarter increase in revenue from retail and services alone was 5.5%, which trails the 10.2% gain realized in the first half.

"During the third quarter, outright purchases were lower than in the first and second quarters of 1974," Cary admitted.

"We are probably seeing some of that in view of the very high level of outright purchases in the last half of 1973, the comparative rates of increase in gross

income and net earnings reported during the first and second quarters of 1974 probably wouldn't continue," he said.

"In view of the record level of purchases achieved in the fourth quarter of 1973, this decline in comparative rates of increase is probably temporary due to the imbalance of the year," he continued.

"Despite softening economic conditions and high inflation rates around the world, shipments and installations of new DP equipment continued at a high level during the third quarter," Cary said.

### Revenues Top \$1 Billion

At Burroughs, revenues for the nine months totaled \$1.05 billion compared with \$891.7 million during the same 1973 period.

Earnings rose to \$81.1 million or \$2.08 a share compared with \$66.2 million or \$1.72 a share in the year-ago period, when there was a \$2.5 million special credit from the sale of securities.

The rate of rise in third-quarter Burroughs earnings again outpaced revenues, 22% to 14% compared with the year-ago figure.

Earnings reached \$25.8 million or 66 cents a share compared with \$21.2 million or 55 cents a share in the year-ago period.

Revenues rose to \$346.7 million from nearly \$303 million in the year-ago period.

Total worldwide orders for the nine-month period increased 21% over the same period last year, while worldwide backlog rose 34% since the beginning of the year, noted Chairman Ray W. McDonald.

Equipment orders in the third quarter continued strong, increasing 18% over last year.

The business minicomputer market, which he said is often viewed as an economic indicator, also continued strong in the third quarter, increasing 17%.

## Direct replacements for IBM 2741 terminals

- Enhanced performance at lower cost
- Rugged and reliable, with heavy duty I/O type Selectric
- Human-engineered for operator comfort and efficiency
- Price plus comparable with IBM
- Promised delivery 120 days
- Backed up by nationwide service
- Built-in dual switchable modems (optional)
- Optional copyholder, work area, utility shelves
- Acceptability proven by many major accounts
- Tape cassette feature for local data collection

**NO WAITING!**

Trendata Model 1500 Cassette Tape Conversational Terminal replaces IBM 2741

Write or call  
for full information



**trendata**  
An Applied Magnetics Company

610 Palomar, Sunnyvale, California 94086 • (408) 732-1799



## Contracts

Systems & Computer Technology Corp. has signed a one-year contract to implement a contract with Delaware Community College, Media, Pa. The firm will also develop an integrated administrative system from its Library of College and University Systems.

Systems Architects Inc. has received a contract from the Library of Congress for design of an automated library information storage and retrieval system that will support a nationwide network of regional libraries providing services to handicapped readers.

Financial Industry Systems has been selected to provide facilities management services to The Comshare Group of insurance companies.

Boeing Computer Services, Inc. has been awarded a contract to service the DP and data communications requirements of the newly formed Jersey Data Network.

Larce Corp. has received a contract from Honeywell, Inc. to provide digital multiplex communication equipment for a traffic control system in Greenboro, N.C.

Dest Data Corp. has been awarded a contract from Dow Jones and Co., Inc. to develop, manufacture and market a flatbed scanner and a computer system for scanning newspaper proofs, converting them to digital signals and, at another site, exposing the information onto offset plates.

Tennecomp Systems has received a contract from the Tennessee Valley Authority for design and manufacture of four Digital Equipment Corp. PDP-11 computer-based monitoring systems.

## TRW to Manufacture, Market POS System

By Madly Upton  
or the co-authors

**LOS ANGELES** — The point of sale (POS) arena has another gladiator, TRW, Inc. has signed a letter of intent with May Department Stores under which it will manufacture and market a POS system developed by May in conjunction with Systems Sci-

ence and Software (S-Cubed).

The system includes credit authorization and check cashing as well as the standard POS functions, said Dick Campbell, vice-president of TRW Communications and Services.

"We believe over the long pull there's a place for us in the retail point-of-sale market. We're very

mindful of the problems that others have had in the past," he said.

"We don't feel that any one supplier in the retail field is going to take the entire market. There's room for several suppliers."

TRW will continue to provide its on-line credit authorization system that interfaces with other POS units, Campbell noted.

Production under way is fully committed to May's needs for the time being, but more will be cut. In the marketplace talking with other retailers about their requirements very shortly, he noted.

"Good Feel"

Comshare's partner, Miroku, is a management consulting firm which offers batch services and "has a good feel for the marketplace," Eidswick said.

"One is to give it a national identification so it's really their system, even though it runs on our technology."

"The other is to allow offering a complete line of services. In addition to on-line time-sharing and remote batch, we can also provide some limited remote batch work."

Although it's expensive to ship a system to Japan, it "will allow Miroku-Comshare to be much more acceptable, having one computer there to allow the Japanese to be able to buy a Japanese product from a Japanese company," he said.

The system uses a Cincinnati Milacron mini for the in-store telephone terminal and a terminal processor made by May's Transaction Data Division.

Campbell noted TRW has been developing its business in communications systems for the retail field for a number of years. The company has also been working with May in developing May's own in-house POS program.

Eventually "it looked like good business for both parties to put the programs together," Campbell added.

Under the agreement, TRW will manufacture over 10,000 terminals in manufacturing facilities turned over to it by S-Cubed.

May sold its interest in S-Cubed back to the shareholders and acquired 100% interest in S-Cubed's TDC Division, with which TRW is working, he explained.

## CDC to Supply Ticketron Terminals

**NEW YORK** — Control Data Corp.'s Terminal Systems Group will supply票机 with 1,000 customized "intelligent ticketing terminals" with installation beginning next year.

Ticketron serves a nationwide network of computerized box offices. Under the Control Data system, a ticket is issued without the information necessary to generate a ticket in the terminal.

To make a sale, he presses a single button and the ticket is printed with date, performance section and price.

Information that will appear on the ticket is first shown on a screen for verification, Ticketron stated.

The 6K terminal will use the Intel 8080 microprocessor, Ticketron spokesman said. Communication with Ticketron computers will be at 1,200 bits/sec over leased lines.

Use of the intelligent terminals will substantially cut the transaction time compared with present equipment, a Ticketron spokesman said.

For example, the unit can receive 10 consecutively numbered tickets in one message. The current terminals need 10 separate messages to do this.

**Award for Model Work Slated for Forrester**

**PHILADELPHIA** — Jay W. Forrester was scheduled to receive the Howard N. Potts Gold Medal of The Franklin Institute last week in recognition of his pioneering work in the mathematical and computer modeling of man, regional and global problems.

Forrester, a professor of management at MIT, obtained the basic patent on magnetic core memory systems early in the development of electronic computers.

He is the author of several books including *The Principles of System* and *The Limits of Growth*.

## MULTIUSER ON-LINE AND

### COBOL

for the

### NOVA

MINICOMPUTER,

Available for immediate delivery.



## Punch it, shoot it, tape it or disk it?

The latest word on Data Entry, in  
our October 30th Supplement.

COMPUTERWORLD

## PROJECT MANAGEMENT FOR 1975

MANAGERS  
AND  
PLANNERS:

NOW THAT YOU HAVE SEEN THE REST—SEE THE BEST!

Auto/Plan - PAC 1

By:

INTERNATIONAL SYSTEMS

150 Allendale Road  
King of Prussia, Pa.  
(215) 265-1550

Please send us information on Auto/Plan and PAC 1.

Name \_\_\_\_\_  
Organization \_\_\_\_\_  
Address \_\_\_\_\_

# IBM Researchers Make Advances On Organic, Bubble Memories

Research on memories at two IBM centers has produced an organic crystal with high electrical conductivity properties, as well as uncovered a more flexible means of fabricating magnetic bubble materials.

A series of new crystal approaches to conduct electrically approaches that of some metals, has been fabricated by scientists at the Thomas J. Watson Research Center, Yorktown Heights, N.Y.

The high conductivity was achieved by replacing sulfur atoms with selenium atoms in a crystal of tetraethiofulvalenium

terial having the same composition as that of the desired alloy film.

In evaporation, high temperatures shake the atoms loose from the surfaces of individual liquid samples of the alloy composition, so that the alloy mix is created right on the substrate surface.

The great advantage of evaporation, said Lee, is that "it eliminates the trouble and expense of making a target for sputtering. It is difficult to obtain a target having the same composition of elements throughout its entire volume, and once a target has been chosen, there is not much flexibility left in the process to vary the composition of alloy films."

"Of course," he continued, "the value of evaporation for making magnetic bubble materials depends on the quality of the end product. And so far, the superiority of evaporated bubble films has not been proved conclusively."

**tracyano-p-quinodimethane, commonly called (TCNQ).**

At room temperature, the conductivity of organic "metals" lies between that of a metal and a semiconductor, and the conductivity increases manifold as the crystals are cooled to cryogenic temperatures.

However, when cooled further — below a transition temperature — they are converted from "metals" into semiconductors.

The materials' solid state behavior, which gives rise to these effects, is poorly understood at this point, however, IBM said.

The creation of the new (TSeF) (TCNQ) crystal is promising because it is one of the most electrically conductive organic metals reported so far, and it retains this conductivity over a wide range of temperatures than any other material, IBM said.

The atomic substitution of selenium atoms for sulfur atoms, which yields a change in electrical behavior, such as doubling the structural strength while keeping the electrical properties of the crystal essentially unchanged, may be an important step toward understanding the solid state properties of the entire class of organic metals, researchers said.

## A Look Ahead

Magnetic bubbles have been reported in amorphous thin-film alloys made by conventional evaporation techniques.

Much simpler than "sputtering" — an alternative process for producing amorphous films — evaporation may offer new flexibility and economy in the fabrication of magnetic bubble materials, noted Dr. Neil Herman and Dr. Kenneth Lee of IBM's San Jose (Calif.) Research Laboratory.

The new magnetic bubble materials are the alloys holmium-cobalt, holmium-nickel and holmium-iron. These films, all about 1,000 angstroms thick, were able to store magnetic bubbles of comparable diameters under favorable conditions of temperature and alloy composition, they reported.

So far, the most frequently used method of preparing amorphous magnetic bubble films has been sputtering, where groups of atoms are chipped away electrically from the surface of a target ma-

## Executive Corner

Noel O. Kile has been named vice-president, international operations, for Quantel Corp.

Aniscomp, Inc. has promoted James C. Newman to vice-president, information systems.

James Butler has become vice-president of product operations at Interactive Data Services, Inc., a wholly owned subsidiary of Interactive Data Corp.

R.J. Thielen has been appointed vice-president of operations at True Data Corp.

# Orders & Installations

Westinghouse Leasing Corp. has installed a Hewlett-Packard 3000 mini-computer which includes HP's new programmable controller.

The controller links Westinghouse's W301 optical mark reader to the HP 3000. The system performs on-line editing of previously scanned information while simultaneously doing on-line data entry tasks.

The Medicus Corp. is installing its food management system in the central office and one correctional facility of the New York City Department of Correction to provide updated food management capabilities.

Handy Andy, Inc. has ordered 132 NCR 255 terminals and eight NCR 726 mini-computers for eight of its supermarkets.

Measures Corp. received an order for two 1000/60 control systems from Finch, Pruyne & Co., Inc.

Society for Savings, a New England mutual savings bank, has ordered 100 Bunker Ramo 2000 universal teller terminals at a cost of \$1 million. The CRTs will display customer account balances and other data as well as tutorial instructions for tellers during unusual transactions.

TWA has ordered 33 Incopter Corp. SPW 20/20 intelligent terminals, valued at \$234,000, for use in flight dispatch service.

Akron Standard has ordered Electronic Associates, Inc.'s Digital Tire Uniformity Computer System to control its tire-testing machines.

Abadie, Software AG's data base management system, was installed on the state of Hawaii's IBM system as it switched from a batch-oriented to an on-line system with an integrated data base and interactive terminals.

**T Series:** High performance tape meeting the standard (ANSI and ECMA) against which the performance of all other cassettes is measured. More in use than any other digital cassette.

**R Series:** Lower-cost certified cassette, also meeting ANSI and ECMA standards.

**Y Series:** Leaderless design for use in Wang or equivalent programmable calculators. Some high-performance features as T Series.

**WP Series:** High quality cassette for word processor or text editing systems using ten inches of clear leader and one-mill recording tape.

**NLT Series:** Leaderless design for use in Wang or equivalent programmable calculators. Some high-performance features as T Series.

**These five cassettes represent more than half of all the certified digital and word-processing cassettes in use throughout the world today.**

**Just something to think about when you buy cassettes... tomorrow.**

**H** Information Terminal Corporation  
323 Soquel Way  
Sunnyvale, California 94086  
Call toll free (800) 536-7938  
In California (408) 245-4400

# Europe's largest EDP market has a new newspaper...

It's called *Computerwoche* (woche is pronounced vo-kuh) and it's *Computerworld*'s new sister publication for Germany. With a full editorial and production staff in Munich, *Computerwoche* is now serving key computer users in the world's third largest computer market with the latest news on products, services and new computer applications.



Biweekly now, *Computerwoche* will be published weekly in 1975, with a circulation of 22,000, including company officers, managers and top technical people at user sites throughout the German market, as well as officers and planners at computer equipment producing companies. It's a whole new way to reach the people you want to talk to in the large and growing German EDP market.

## And another Caravan

The travelling Computer Users' Forum and Exposition, The Computer Caravan, will be visiting the German market again in 1975 with a five-city tour of leading German EDP markets.

Hamburg.....February 18-20  
Dusseldorf...February 25-27  
Frankfurt.....March 4-6  
Stuttgart.....March 11-13  
Munich.....March 18-20

Thousands of top EDP users will be attending the German Caravan to look at peripherals, minicomputers, terminals, software, services and supplies. And 1975 should be a good year for EDP marketing in Germany, because it should be the first country to come out of the current worldwide recession—thanks to firm anti-inflationary measures applied a year ago. Overall user spending is expected to grow 14% in 1975.

If you're marketing EDP products or services in Germany—or if you'd like to—you should be looking closely at *Computerwoche* and The Computer Caravan. For more information just send in the coupon. Or you may contact Computerworld GmbH, Tegernseer Landstrasse 300, 8 München 90. Phone 089 690 06 51. Telex: 5-28108. It could be the besten tat you did all day.



To: Neal Wilder  
Vice President, Marketing  
**COMPUTERWORLD**  
797 Washington Street  
Newton, Mass. 02160

Please send information on:  
*Computerwoche*    The German Computer Caravan.

Check here \_\_\_\_\_ if you would also like to receive information on our other sister publication, *Shukan Computer*, the EDP newsweekly for Japan.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_



# COMPUTERWORLD

## Computer Automation Broadens LSI Line

IRVINE, Calif. — Computer Automation, Inc., the Naked Mini company, has expanded its line of LSI minicomputers to include the LSI Type 2/10, which has an internal cycle time of 60 nsec.

The 2/10 falls between the more expensive, twice as fast LSI Type 2/20 and the less expensive, half as fast LSI Type 1, which the firm is not yet marketing.

The processor series is interchangeable with Computer Automation's line of memories, which includes 980 msec, 1,200 msec and 1,600 msec core and 1,200 msec semiconductor.

The two models feature the same architecture, instruction set and I/O modes and can be interchanged in the same motherboard without program alteration, the firm said.

An LSI 2/10 with 4K 16-bit core semiconductor memory is priced at \$1,750 in single quantities from 18651 Von Karman, 92664, Deerlivery is 30 days.

### Peritus Unveils CRT

SANTA ANA, Calif. — Peritus Corp. has unveiled the Model 7100 CRT terminal which can be used for either remote data entry or locally with a direct computer interface.

The unit features read-only memory, controlling keyboard, display and communications

functions, which allow the unit to be modified to different system requirements.

The screen is 5 1/2 in. by 8 1/4 in., uses 7 by 9 dot matrix characters, 80 char./line with either 12- or 16-bit vertical resolution. Standard character set is 64 ASCII characters or 96 with lower case.

The keyboard is detachable and page and scroll modes are included.

Synchronous or asynchronous modes up to 9,600 bit/sec are

### OEM Products

optionally available as are direct computer interfaces.

A modem adapter enables daisy chaining of up to 64 terminals, the firm said.

Pricing starts at \$2,025 each in lots of 100 frt. cost. Business Systems Division, 17112 Armstrong Ave., 92705.

### Counter Has 4 Indicators

MOUNTAIN VIEW, Calif. — Logic Technology, Inc., has developed the Model 1812 handheld pulse counter with a LED display of up to seven digits using four indicators.

The firm is seeking to OEM the unit, priced at \$150 in single quantities, to voltmeter firms which will then sell it to OEMs.

Dicom Industries' Model 176 digital cassette subsystem, an E-m-a-compatible single-transport device, is designed to perform the normal functions of a cassette tape system under controller/formatting. It also allows "custom" designed special functions such as magnetic tape emul-

ation. The unit can incorporate an additional microprocessor, thus functioning as a stand-alone unit. It is priced at \$500 in OEM quantities from 715 N. Pasadena Ave., Sunnyvale, Calif. 94086.

Western Digital Corp. has begun volume production of the WDI 1018, a Model 1018 1K-bit random-access memory. The single-chip device is functionally and pin-compatible with those announced by Texas Instruments and Intel, the firm said.

Access time is 100 nsec, maximum with a 470 nanosecond memory cycle time. The unit, available for system prototyping, comes in a 22-pin plastic cavity package and sells for \$27 in quantities over 100 from 3128 Red Hill Ave., Newport Beach, Calif. 92663.

### Expansions

Computer Sciences Corp. has recently opened Infonet offices in Atlanta and Pittsburgh.

Systems Architects, Inc. is moving its headquarters to a 12-acre site at Thomas Patton Drive, Randolph, Mass.

National Semiconductor Corp. has begun construction of a 175,000-sq-ft semiconductor wafer fabrication plant in West Jordan, Utah.

Monolithic Memories, Inc. has moved into a 40,000-sq-ft building formerly occupied by AMDahl Corp. The new facility will house the Production Control and Reliability Groups as well as new wafer fabrication lines.

## Position Announcements

### Systems Programmer

For the Systems Programmer with suitable experience, this technical position offers excellent opportunities.

Your general assignment will be systems software on a dual IBM

370/165 OS/MFT configuration. This will involve a wide range of developmental activities including software analysis of systems performance and troubleshooting.

The required experience are dual. First, at least 6 years of large scale DP

experience is called for, or more concentrated in software. In

depth knowledge of OS and assembler language programming is

essential. Knowledge of TCAM, TOTAL, teleprocessing, and real-time

jobs areas a plus. Some knowledge of hardware design, plus very

complete electronics. Please send resume, in confidence, to:

Dennie Yemasaki, Employment Manager

### Champion International

1000 Mayfield Ridge Drive  
Hamilton, Ohio 45020

An Equal Opportunity Employer M/F

### R&D CONSULTANT

Research at Digital involves close interaction between R&D and Software/Hardware engineering. Researchers work closely with management, and are highly motivated, innovative team of professionals. At Digital you are the action — you perform and are able to see tangible results from your efforts.

We currently seek an individual to act as an internal researcher in the area of advanced manufacturing processes for manufacturing and test equipment (including chips, modules, processors, peripherals and complete systems).

Working in a problem solving mode, the initial areas of concern will involve testing LSI IC's, and acceptance testing of systems. Additional responsibilities will involve the tracking and contract monitoring of university research in automatic visual inspection, automatic assembly, and programmed industrial robots.

This position requires the ability to deal effectively with both hardware and software development engineers, as well as application personnel. The ideal candidate will have a PhD in electrical engineering, computer science, or equivalent, along with strong knowledge of computer hardware and software. Ability to relate to people, and heuristic methods in solving practical problems is must. Previous experience in one or more of the following areas would be a plus: automated testing, applied artificial intelligence or advanced manufacturing methods.

If you seek an above average opportunity, and feel you can contribute in a dynamic environment, you should investigate this position.

Please direct your resume to Leo McKenna, Digital Equipment Corporation, Research & Development Group, 162 Main Street, Maynard, Mass. 01754.

**digital**  
digital equipment corporation

The above positions are open for application to women and men regardless of race, national origin, age, religion or creed.

## Run With Us

Whether you're buying, selling, swapping, hiring, or looking, Computerworld Classifieds work.

**HOW TO ADVERTISE:** Our rates are \$44.80 per column inch. The minimum size ad is 1 column wide by 2 inches deep, and costs \$89.60.

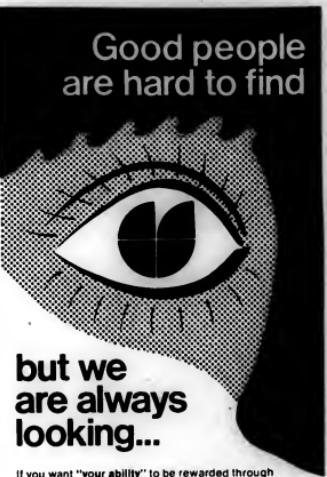
For a minimum size ad, figure that one 18-character headline (12-characters if all capitals) plus your company name and address at the bottom will fill about 1 inch of depth. You can then fit about 50 words of copy in the remaining inch of depth. Additional space is available in half-inch increments if more space is needed.

**WRITE YOUR AD** and send it to: Computerworld Classified Advertising, 797 Washington St., Newton, Mass. 02160. We will set the ad in fonts available without charge. Reverses, tints, and complicated work will be billed at cost. We will use our best judgment in setting up ads supplied without layouts. Ads set up and not used will be billed at cost for composition.

**BLIND BOX** is \$1 extra per insertion.

**FOR MORE INFORMATION**, contact your area Computerworld Sales Office, or call Sara Streets at (617) 965-5800.

**COMPUTERWORLD**  
THE INDUSTRY'S LEADER FOR THE COMPUTER COMMUNITY  
797 Washington Street, Newton, Massachusetts 02160 • Phone: (617) 965-5800

POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS	POSITION ANNOUNCEMENTS																												
<p><b>ROTH YOUNG HAS OVER 250 POSITIONS AT ALL SALARY RANGES COAST-TO-COAST TO FILL IMMEDIATELY ALL FEES CO. PAID</b></p> <p><b>CONTACT US FOR OUR COMPLETE LISTING</b></p> <p><b>SYSTEMS ANALYSTS SYSTEMS PROGRAMMERS PROGRAMMERS</b></p> <table border="1"> <tr> <td>Systems Analyst</td> <td>Semi-Advanced Prog., <b>\$11-13M</b></td> </tr> <tr> <td>COBOL, PL/I, Fortran</td> <td>10-16M</td> </tr> <tr> <td>Asst. Programmer</td> <td>10-16M</td> </tr> <tr> <td>COBOL, PL/I, Fortran</td> <td>12-13M</td> </tr> <tr> <td>IBM 370/CS/V 1 or 2</td> <td>21-25M</td> </tr> <tr> <td>IBM 360 disc &amp; tape</td> <td>15-18M</td> </tr> <tr> <td>PL/I, COBOL, Fortran</td> <td>15-18M</td> </tr> <tr> <td>Lead Programmers</td> <td>16-17M</td> </tr> <tr> <td>Systems Analysts</td> <td>16-17M</td> </tr> <tr> <td>Systems Info. Analysts</td> <td>16-17M</td> </tr> <tr> <td>System Programmers</td> <td>16-17M</td> </tr> <tr> <td>Network System Prog.</td> <td>16-17M</td> </tr> <tr> <td>Corp. Data Mgr.</td> <td>16-17M</td> </tr> <tr> <td><b>MANY MORE POSITIONS NOT LISTED</b></td> <td><b>15-25M</b></td> </tr> </table>	Systems Analyst	Semi-Advanced Prog., <b>\$11-13M</b>	COBOL, PL/I, Fortran	10-16M	Asst. Programmer	10-16M	COBOL, PL/I, Fortran	12-13M	IBM 370/CS/V 1 or 2	21-25M	IBM 360 disc & tape	15-18M	PL/I, COBOL, Fortran	15-18M	Lead Programmers	16-17M	Systems Analysts	16-17M	Systems Info. Analysts	16-17M	System Programmers	16-17M	Network System Prog.	16-17M	Corp. Data Mgr.	16-17M	<b>MANY MORE POSITIONS NOT LISTED</b>	<b>15-25M</b>	<p><b>"COMPUTER PROGRAMMER</b> at community college. Two years experience, some supervisory knowledge of COBOL and file management. Associate degree in computer science or related field.</p> <p>Resume to Jon Larson Berkeley College Pittsfield, Mass."</p>	<p><b>PROGRAMMER ANALYST</b></p> <p>Are you ready to take a large international manufacturing corporation? Build your career with us in Milwaukee, Wisconsin. American Parts Operation located in the heart of the Midwest, in the third largest city in the country. Ideally situated thirty minutes from Milwaukee and one hour from Chicago.</p> <p>We offer a competitive starting salary plus excellent working conditions. This is a challenging position in a 370/1450 on-line environment with a strong programming background and excellent opportunities. Experience in data design is required.</p> <p><b>PROGRAMMER</b></p> <p>This position requires an individual who is highly motivated and has a strong background in COBOL and a strong background in PL/I.</p> <p>Send resume and salary history in strict confidence to:</p> <p><b>Massachusetts Department of Transportation</b> Mass-Patron Inc. 2200 Old Coventry Rd. Rockville, Maryland 20842 (301) 429-7711 Ext. 381</p> <p>An Equal Opportunity Employer</p>	<p><b>DIRECTOR OF CORPORATE &amp; INDUSTRIES SYSTEMS</b></p> <p>Here is a unique opportunity for a professional with at least 8 years of experience in systems analysis and design of information systems at corporate level. You should have significant experience in financial systems, including General Accounting, Financial Reporting, Budgeting, Forecasting, Cost Control, and other corporate oriented systems. You will also be responsible for developing systems for our industrial clients and other parties.</p> <p>This is a nationwide position which is part of a major commitment to install multiple IBM 370 on-line computer systems to assist in solving our business problems. We require a Bachelor's degree, preferably in M.B.A. or master's degree in accounting or business.</p> <p>We are seeking with annual sales in excess of \$1 billion dollars. Please send complete resume including salary history.</p> <p>Mr. Jerry Austin Director of Personnel Fleming Industries Inc. P.O. Box 26464 Oklahoma City, Oklahoma 73126 An Equal Opportunity Employer M/F</p>	<p><b>UNIVERSITY OF OKLAHOMA</b></p> <p><b>Programmer/Analyst</b></p> <p>3 years experience on third generation (370/160) hardware, COBOL language, assembly language, and data base management system required. Bachelor's degree in Business, Computer Science, Engineering, Mathematics or equivalent.</p> <p><b>Systems Analyst</b></p> <p>3 years experience in design of systems for third generation hardware. Preferably in a data base management, on-line environment. Project management experience, including system design, implementation, testing, documentation. Bachelor's or Master's degree in Business, Industrial Management, Computer Science, or equivalent fields, or equivalent experience. Salary commensurate with experience.</p> <p>For detailed information contact Personnel Services, 905 Asp, Norman, Oklahoma 73072 (Cross MEC).</p> <p><b>EQUAL OPPORTUNITY EMPLOYER</b></p>
Systems Analyst	Semi-Advanced Prog., <b>\$11-13M</b>																															
COBOL, PL/I, Fortran	10-16M																															
Asst. Programmer	10-16M																															
COBOL, PL/I, Fortran	12-13M																															
IBM 370/CS/V 1 or 2	21-25M																															
IBM 360 disc & tape	15-18M																															
PL/I, COBOL, Fortran	15-18M																															
Lead Programmers	16-17M																															
Systems Analysts	16-17M																															
Systems Info. Analysts	16-17M																															
System Programmers	16-17M																															
Network System Prog.	16-17M																															
Corp. Data Mgr.	16-17M																															
<b>MANY MORE POSITIONS NOT LISTED</b>	<b>15-25M</b>																															
<p><b>CLEVELAND</b> 5200 Mayfield Rd. (216) 853-4700</p> <p><b>COLUMBUS</b> 2505 S. High Street (614) 886-0400</p> <p><b>PITTSBURGH</b> 101 First Avenue (412) 243-0100</p>	<p><b>Good people are hard to find</b></p> 	<p><b>PROGRAMMER/ANALYST</b> (IBM Systems II)</p> <p>We are a relatively soft goods manufacturing company revamping its total information system. Position requires information feed and retrieval methods with a charitable attitude. Must be a graduate E.O.P. Staff awaiting a person with 3-5 years of appropriate experience.</p> <p>Interested qualified candidates should write to:</p> <p>CV #224 787 Washington St. Newton, Mass. 02164</p> <p>An Equal Opportunity Employer M/F</p>	<p><b>SYSTEMS PROGRAMMER</b></p> <p>Must be capable of accepting sole responsibility for a project from initiation through completion. Must be experienced in COBOL and proficient in ALG with experience in designing systems and writing programs. Must be experienced in data processing and have good communications skills. Ideal candidate will have a degree in computer science with a knowledge of accounting and data base and reprocessing techniques involving a large number of terminals.</p> <p>For more information, application forms call collect before October 20, 1974, (404) 269-2170, Herb Parker.</p> <p>An Equal Opportunity Employer Functioning Under an Affirmative Action Plan.</p>	<p><b>SYSTEMS PROGRAMMER</b></p> <p>Mr. John Schaffert Director of Data Processing Monterey Service and Learning Association P.O. Drawer 1000 Monterey, Calif. 93940</p>																												
<p><b>but we are always looking...</b></p> <p>If you want "your ability" to be rewarded through financial growth and personal satisfaction by working with a young growth oriented company, then we would like to meet you.</p> <p>You will be marketing Cincom Systems and their products TOTAL and ENVIRON/I which are the recognized leaders in the area of Data Base Management and Data Communication.</p> <p>The professional we need for this area will have a successful software or hardware sales background along with knowledge of operating systems and applications.</p> <p>If you like what you see, then we invite you to hear the whole story.</p> <p>All replies held in confidence and answered.</p> <p>Cincom Systems Inc., Recruiting, 2300 Montana Ave. Cincinnati, Ohio 45211 513-662-2300.</p>	<p><b>Sell! Sell! Buy!</b></p> <p>Buyers meet sellers in Computerworld Classifieds.</p> <p><b>Cincom Systems, Inc.</b></p> <p>An Equal Opportunity Employer</p>	<p><b>2 DATA PROCESSING EDUCATORS</b></p> <p>Sponsored by the Rochester Institute of Technology, our major objective is to provide qualified deaf students with technical post-secondary education in order to prepare them for satisfying careers in the field of data processing. Through our educational and expansion program creating these 2 challenging and rewarding career opportunities. Working alongside the leading technical institutions in the country, we are involved in teaching, training and tutoring our students, developing instructional materials and curriculum, and coordinating research activities for identifying additional areas of expertise. If your area of expertise lies in either area below, we've got a lot to talk about!</p> <p><b>COMPUTER EDUCATIONAL SPECIALIST</b></p> <p>Requires on M.S. in Computer Science or equivalent educational experience. You should possess working familiarity with time-sharing terminals and graphic displays; XDS computers; communications or data processing systems (FORTRAN, COBOL, ASSEMBLY, etc.); and systems analysis and design (hardware and software). Teaching, industrial experience, and knowledge of deafness helpful.</p> <p><b>DATA PROCESSING INSTRUCTOR</b></p> <p>Requires on M.S. in computer education, systems design, and/or relevant area plus knowledge of RPG, COBOL, and/or BAL. You must be willing to learn manual communications. M.S. Degree preferred.</p> <p>Each opportunity carries an attractive salary and benefits package. Your current classification that few jobs can ever offer. If this sounds good, please send your resume or C.V. indicating specific position, in strict confidence to: NTID PERSONNEL DEPT.</p>	<p><b>NATIONAL TECHNICAL INSTITUTE FOR THE DEAF</b> ROCHESTER INSTITUTE OF TECHNOLOGY</p> <p>One Lomb Memorial Drive, Rochester, New York 14623 An Equal Opportunity Employer</p>	<p><b>COMPUTER EDUCATIONAL SPECIALIST</b></p> <p>Requires on M.S. in Computer Science or equivalent educational experience. You should possess working familiarity with time-sharing terminals and graphic displays; XDS computers; communications or data processing systems (FORTRAN, COBOL, ASSEMBLY, etc.); and systems analysis and design (hardware and software). Teaching, industrial experience, and knowledge of deafness helpful.</p> <p><b>DATA PROCESSING INSTRUCTOR</b></p> <p>Requires on M.S. in computer education, systems design, and/or relevant area plus knowledge of RPG, COBOL, and/or BAL. You must be willing to learn manual communications. M.S. Degree preferred.</p> <p>Each opportunity carries an attractive salary and benefits package. Your current classification that few jobs can ever offer. If this sounds good, please send your resume or C.V. indicating specific position, in strict confidence to: NTID PERSONNEL DEPT.</p>																												

## POSITION ANNOUNCEMENTS

## POSITION ANNOUNCEMENTS

**PROGRAMMERS**

Growth Company has immediate need for programmers in modern facility located in Lake County, Ill. This is an opportunity for ground floor entry to a Company on the cutting edge of the computer industry. We offer a unique systems approach. Successful applicants will have one to two years experience and an ability to conceive and implement new applications.

**EXCELLENT BENEFITS AND SALARY**

Send resume of experience and salary requirements in confidence to:



**ANCHOR COUPLING CO. INC.**  
242 N. Foster St.  
Libertyville, Illinois  
An Equal Opportunity Employer M/F

**Computer Professionals**

**Nothing succeeds like excess!**

There is only one best way to advance your career most effectively, and that is by looking at the maximum number of opportunities available to you.

The time that is right now. Never before have we had such an extensive range of opportunities available. Far more than you could find anywhere else.

Take advantage of the urgent demand for your services. Contact your nearest ESP Associates office today — for a brighter tomorrow.

**esp associates**

## DATA PROCESSING IRANIAN CITIZENS

Iranian Government Positions Open For:

**SYSTEMS ANALYSTS**

Experience desirable in any of the following:  
IMS, Data Base Design & Communications,  
TSO, HASP, OS/VS2.

Bachelor's Degree in Math, Econ, Engineering or Computer Science.

**PROGRAMMER**

Experience desirable in any of the following:  
COBOL, FORTRAN-IV, PL/I, ASSEMBLER, RPG.  
Bachelor's Degree in Math, Econ, Engineering or Computer Science.

**COMPUTER OPERATOR**

Experience desirable with any of the following:  
NCR: Century 100, 39.  
IBM: 370, 158, 145, S/III  
HONEYWELL: 6000

Mail resume and transcript of college records to:

**PACIFIC ARCHITECTS AND  
ENGINEERS INCORPORATED**

600 S. Harvard

Los Angeles, CA 90005

(an equal opportunity employer)

## POSITION ANNOUNCEMENTS

**SYSTEMS PROGRAMMER**

Aid in maintaining advanced PDP/10/PDP-11 data processing systems for scientific fusion energy research experiments at major experimental laboratories. Good knowledge of PDP-10, fluency in MACRO-10 with work on SCPS-10 monitor required. Full time position. Liberal benefits, beautiful surroundings, work on the most challenging technical environment for men. U.S.A.C.E. funded, university operated. Highly skilled employment record. Send resume with salary requirements in confidence to:

Personnel Director P-500  
Lawrence Livermore  
Plasma Physics Laboratory  
P.O. Box 461  
Princeton, New Jersey 08540

"**DIRECTOR OF COMPUTER SERVICES**, community college. Service to administrative and academic departments, including Business Data Processing discipline and county-wide time-sharing project.

Send resume to Passaic Valley, Jr. Dean of Administration  
Passaic Community College  
Pittsfield, Mass.

**DATA PROCESSING OPPORTUNITY**

For a Programmer-Analyst in Northeast Mississippi.

Public Utility Customer Accounting background helpful. Multiple opportunities exist for growth and fringe benefits are exceptional. Requirements:

Computer Systems Association  
Systems Development  
Box 348  
Tupelo, Mississippi 38801

**GENERAL MANAGER**

EDP Remarketing Company  
Opportunity for experienced design, sales and marketing computer equipment marketplace manager. Position involves running a major IBM 370 leasing company located in the northeast on the East Coast. Candidate will have excellent compensation, incentive and profit sharing plan. Experience should be a shiftless manager development within the industry.

Please contact: Personnel Advisor  
EDP Remarketing Company, Inc.  
A Division of CFS Financial Corp.  
Boston, Massachusetts 02109

**SALESMAN WANTED**

Leading computer ribbon manufacturer seeks experienced Sales and Managerial personnel, representatives, etc.

Excellent opportunities for men now selling computer ribbons, typewriter ribbons and computer tapes.

CW Box 4216  
797 Washington St.  
Newton, Mass. 02160

**DATA PROCESSING PROFESSIONALS**

V.P.-Sales, Tech. Dir., Sales \$35-40K  
Mgr.-Sys. & Prog. \$25-30K  
Mktg. Mgr., Prod. Mgr., \$15-20K  
S/Sys. Plnning Ass't, Proj./Anal., \$12-18K  
S/Sys. Dev. Mgr., \$12-18K  
S/Sys. Anal.-Des. Auto., To \$22K  
S/Sys. Dev. Eng., \$12-18K  
Compu. Add-On Mgmt., Sales \$20K-  
Compu. Add-On Eng., Sales \$18K-  
Compu. Software Dir., \$18K-  
Hardware Eng., \$12-18K

All specialists in the search for professionals and management talent. In the short time since our company was founded, individuals for these and many other positions have been recruited. If you're now a manager or ready to move up, we invite you to call or write in complete confidence or call and speak to us about our unique professional staff at the office most convenient to you.

Employee benefits pay over fees.

Office: Management Resources, Inc.  
800 Peachtree Street, N.E.  
Atlanta, Ga. 30309  
(404) 522-5660

Brussels, B.C.  
(604) 542-1966

## POSITION ANNOUNCEMENTS

## POSITION ANNOUNCEMENTS

## POSITION ANNOUNCEMENTS

## POSITION ANNOUNCEMENTS

Fastest expanding computer installation in western Massachusetts has need for Programmer Analyst with 2 plus years COBOL experience and a desire to participate in the development of a new system. Excellent compensation and benefits. Current equipment includes 370/145 Operating under DOS/V and CICS with 40 plus 3270 local and remote CRT.

**ALSO****COMPUTER OPERATOR**

Creating new position in our Data Processing Dept. Applicants with 1-2 years experience on IBM model 370.

Excellent starting salaries, insurance, tuition refund program and other outstanding benefits. Please forward resume to:

**PERSONNEL MANAGER**

**MILTON BRADLEY COMPANY**  
443 Shaker Road  
East Longmeadow, Mass. 01028  
An Equal Opportunity Employer

**Do you want to be ...**

## On The New Frontiers of Computer Technology?

Boeing Computer Services is already there, expanding the frontiers all the time.

If you have the proven spirit and the necessary background, we invite you to join our team in Seattle, Washington, and other locations across the country.

We will train and then assign you to design and implementation teams for large, sophisticated engineering, manufacturing and financial information systems. Such systems include Teleprocessing, Terminal Networks and associated applications and software; Top-Down Design and Structured Programming; Data Base Design and Processing with such tools as IMS, COBOL, DB Preentry; design, programming, testing and implementation of large integrated Data Base systems.

These openings are for:

**PROGRAMMERS ANALYSTS**

Preferably three or more years experience in development, implementation and maintenance of information systems using knowledge of 360/370 hardware, COBOL and DS JCL programming.

**DATA BASE DESIGNERS ANALYSTS**

Preferably one or more years experience with IMS 2 or IMS-VS or physical or logical Data Base applications. Large scale hardware experience desirable.

There are also openings for the following:

**MINICOMPUTER SYSTEMS SPECIALISTS**

FOR APPLICATION ANALYSIS - to evaluate cost-effectiveness of minicomputer application for data entry and Data Base management.

FOR SYSTEM DESIGN - to use minicomputers for business systems, D/T, word processing, switching machines and intelligent terminals. Experience with current generation minicomputers and 186/370 systems preferable.

FOR SOFTWARE SYSTEMS - to develop and maintain minicomputer software systems and propose comparative analysis of operating systems.

Please send your resume to The Boeing Company, P.O. Box 3700 AEQ, Seattle, WA 98124

An equal opportunity employer.

**BCS**

BOEING COMPUTER SERVICES, INC.

## POSITION ANNOUNCEMENTS

## POSITION ANNOUNCEMENTS

## POSITION ANNOUNCEMENTS

## DATA PROCESSING SYSTEMS PROGRAMMER

Present system is 256K IBM 370-145. Operates under DOS/V and POWER. Uses DBOMP as data base management system to support manufacturing applications.

Planned conversion to OS/VS using IMS to support large scale data base and on-line applications.

Individual will report to Senior Systems Programmer. Degree and previous systems programming experience desirable.

Excellent benefits, working conditions and promotional opportunities.

Send resume to Bob Lahr, Employment Supervisor or call (518) 754-3626.

## FISHER CONTROLS COMPANY

GOVERNOR ROAD

MARSHALLTOWN, IOWA 50158

An Equal Opportunity Employer

## ANALYST/PROGRAMMERS

The Pawnee Division of the Cessna Aircraft Company, world's leading manufacturer of business, personal, and utility aircraft, is now offering excellent opportunities to qualified analyst/programmers.

These positions require individuals capable of accepting sole responsibility for a project, from initial contact with the user to implementation of the system. The primary considerations will be experience in COBOL, with preference in designing systems and writing associated programs. Applicants should be experienced in manufacturing and inventory applications and familiar with IBM 360 and 370 and teleprocessing equipment.

These are salaried positions, offering attractive salaries, professional challenges and outstanding career growth potential. If you have the necessary qualifications, we'd like to hear from you. Send resume and salary requirements to:

Cessna Aircraft Company  
Pawnee Division  
Human Resources Manager  
P.O. Box 1521, Dept. AP  
Wichita, Kansas 67201

An Equal Opportunity Employer



## BUSINESS EDP

See WHY AMTRAK Offers You Rapid Career Progress Opportunity That's Hard to Equal!

AMTRAK is the organization that's revitalizing railroad passenger travel. AMTRAK statistics have gone up, up, up at a phenomenal rate. And you can be part of it. If you're interested in coming to the energy shortage add extra reason to build rail travel.

**SYSTEMS ANALYSTS**  
will find extraordinary chances to move ahead as we implement constantly increasing staff, promote, and start new operations. The successful design candidate should have familiarity with both mainframe and mini-computer systems. 2 years of experience with COBOL, or the equivalent, and demonstrate effectively at all levels. Training and development are provided. Applications are open to all. Write, wire, or call collect to: Amtrak, Box 1100, Washington, D.C. 20004. No phone calls please. Applications are sought. Interested bus lines? See us at our "Fastest Career" booth at the International Computer Show in New York City.

## LOCAL INTERVIEWS WILL BE ARRANGED

To arrange for your local interview, forward resume AT ONCE, including salary history, in confidence, to: S. Horne, Corporate Employment, C.R.

Amtrak

955 L'Enfant Plaza North, SW  
Washington, D.C. 20024  
The Fastest Career  
Train Around!

An Equal Opportunity Employer M/F

## SYSTEMS ANALYST

A state level position is working at a major corporation with the following qualifications:  

- 2 years experience
- 2-3 years Systems Analyst experience
- Ability to deal with people
- Skills in written communication
- Self-starter
- Previous experience desired but not required.

The position is located in Jefferson City, Missouri, and requires frequent travel. The responsibilities involve the creation of a statewide information system. Send resume and salary requirements to:

CW Box 4238  
Neodesha, Miss. 66048

An Equal Opportunity Employer

## SENIOR SYSTEMS ANALYST

Surface Div. of Fortune 100 electronic firm is seeking a computer programmer to join its team. Min. 5 yrs exp. Emphasis on min. 3 yrs bus. exp. Must be able to program a plus. BS pref'd. \$13,000. Fm. Held.

## ROBERT HARVEY PERSONNEL AGENCIES

1310 Liberty Bank Bldg.  
Buffalo, NY 14202

## CONTRACT PROGRAMMER ANALYST

360/370  
OS DOS  
JCL  
COBOL BASIC

All Commercial Applications

Out of State Work Area

HMG Consultants, Inc.

203 East 23rd St., Suite 1000  
(212) 734-1857

Director of Health Sciences  
University of Louisville's Health Sciences Computing Center is seeking a Director of Health Sciences Computing Center. The Director will be expected to maintain and expand the computing services currently available to the university actively in planning the computing services required by the university and hospital. Current operations include research, teaching, administrative and student records, and medical billing. The Director will be responsible for the system on site and RJE to a 370/165 sys. 233,000 lines of code. Call 502-552-2231. Contact Larry Ross, University of Louisville, 4025 S. Limestone, Louisville, Kentucky 40292. (502) 552-2231. An Equal Opportunity Employer

## DIRECTOR HEALTH SCIENCES UNIVERSITY OF LOUISVILLE

The University of Louisville's Health Sciences Computing Center is seeking a Director of Health Sciences Computing Center. The Director will be expected to maintain and expand the computing services currently available to the university actively in planning the computing services required by the university and hospital. Current operations include research, teaching, administrative and student records, and medical billing. The Director will be responsible for the system on site and RJE to a 370/165 sys. 233,000 lines of code. Call 502-552-2231. Contact Larry Ross, University of Louisville, 4025 S. Limestone, Louisville, Kentucky 40292. (502) 552-2231. An Equal Opportunity Employer

## Buy Sell Swap

### FOR SALE

Burroughs L2000  
A1300  
A1500 49 Card Punch  
A509 Control Unit  
Eng. to Pets Skinner  
(406) 257-2340

### 360 Model 50

#### AVAILABLE FOR IMMEDIATE LEASE

Any core size, CPU only or complete system including I/O set. For an immediate private call Sid Weller, Director of Marketing (201) 569-3838  
Diabolt Computer Leasing, Inc.  
117 South Orange Avenue  
Englewood, New Jersey 07631

### FOR LEASE

#### 360/30 32K

No Reasonable  
Offer Refused  
James O. Davis  
P.O. Box 9438  
Shreveport, LA 71109  
(318) 425-1401

### IBM 1401 WITH 1311 DISK

For Sale  
Also 729 Tape Drives

\*\*\* D.P. Equipment  
\*\*\* Marketing Corp  
260 W. Broadway N.Y. N.Y.  
CALL (212) 929-7337 Ext. 1

### IBM 360/370 UNIVAC + CDC HONEYWELL

Flexible plant, inventories, fast service  
on systems & peripherals.

Call US

WASHINGTON  
INTERSTATE  
PITTSBURGH  
ATLANTA  
CHICAGO  
DETROIT  
KANSAS CITY  
DALLAS  
HOUSTON  
LOS ANGELES  
SAN FRANCISCO  
PORTLAND  
HAMBURG  
GRENZ  
PARIS

(703) 527-2900  
(412) 263-2000  
(415) 227-3077  
(404) 352-2000  
(312) 343-6056  
(313) 446-2000  
(816) 471-2716  
(214) 520-2000  
(713) 441-6225  
(213) 635-2000  
(415) 528-2000  
(503) 223-2000  
(0) 30 20 21  
(718) 273-2000  
(708) 759 18 40

Computer  
Systems  
2001 Jefferson Davis Hwy., Arlington, VA 22202  
Branches: Indianapolis, Indiana  
Member: Computer Leases Association

### WANTED

#### 360/40

#### TELEX 2314

Compatible Disk  
Charly Prochelo  
CALL: 612-546-4422

### dataserv

400 South Pauline, Suite 415  
Minneapolis, Minnesota 55426  
Member: Computer Dealers Assoc.

### BUY SELL SWAP

## OPEN TO BUY MINIS

DEC-HONEYWELL  
Data General  
HP-SEL-IBM  
Vanderbilt  
etc...  
Available Cash

Large Lots Preferred  
(617) 261-1100

## AMERICAN USED COMPUTER CORP.

P.O. Box 68, International Station  
Brentwood, Tennessee 37025  
TWX: 710-321-6388

COMPUTER DEALERS  
ASSOCIATION

## CDC 841 For Sale

GIBBS Enterprises Inc.  
Box A Hingham, Mass.  
02043 (617) 749-7491

## Computer Disk Packs for Lease

Models  
2316 - \$5.00 per month  
1316 - \$3.00 per month

Two year term minimum.  
Other rates available  
by arrangement.

Computer Packs Unlimited  
(305) 468-0000 or write  
446 Royal Palm Way  
Palm Beach, Florida 33480.

## For Sale, or rent, or trade

### IBM 2365 Model 2 Immediately Available

Federal Data Corporation  
(301) 652-5766

## INVENTORY LIQUIDATION

Nova 800 &  
840 computers

Disk Drives, MDS Line  
Printers, Track Drives,  
Serial Terminals, and more.

Mr. Nutter, after 10  
(617) 364-1512

## FOR SALE OR LEASE NCR-500 SYSTEM

1517-141 Processor  
1509-14 Program Bars

1519-14 M/L Console  
1524-14 30 CPS Tape  
Punch

1. 563-24 50 CPS Tape  
Reader

1. Zero Supression Feature for 517

Call or Write:  
Jim Ruggles

International Plastics, Inc.  
10 Innovation Lane  
Colwich, Kansas 67030  
(316) 796-1234

## BUY SELL SWAP

**PAPER TAPE READERS**  
**PAPER TAPE PUNCHES**  
**TAB CARD READERS**

Available at attractive low prices with or without power supply; 8A to 12A, 110V, 50/60 Hz ground. Environment 60 to 80°, humidity 30 to 80%; 520 STUs. All models: 1403N1, paper tape punch and reader; 80- or 60-column, hopper-fed 250 cps tab card reader.

Direct all inquiries to Bob Mersenni, The Singer Company, Business Machines Division, 2350 Northgate Drive, San Leandro, CA 94571. Telephone (415) 357-8600.

**SINGER**  
 BUSINESS MACHINES

**FOR SALE**  
**BY OWNER**

1 IBM 2402/2 Tape Drives  
 3 IBM 2401/2 Tape Drives  
 9T, 800 BPI  
 COMPUTER  
 PETER A. BEAL  
 THE STANLEY WORKS  
 198 PARK STREET  
 NEW BRITAIN, CONNECTICUT 06050  
 (203) 225-9111

2040 G, # 22414

36 Month Lease  
 at \$1,250 per Month

December

 Contact  
 Mr. Russell  
 (602) 248-0457
**FOR SALE**
 IBM 360/30 65K  
 1-1051  
 1-1052  
 1-2641  
 3-2311

## 11-2311 Disk Packs

 Call or Write:  
 Woodmen Accident & Life Co.  
 George Klein, D.P.M.  
 P.O. Box 1000  
 Lincoln, Neb. 68501  
 (402) 432-2688 Ext. 376

**FOR SALE**  
**RIVON DATA SETS**

 Sebit 48C  
 Data Sets (Five)  
 Data Quality Meters

 For Information  
 Contact Herb Danenow  
 770 N. Water Street  
 Milwaukee, WI 53201  
 (414) 785-7468

**BUY-SELL-LEASE**  
**WE WANT TO BUY**

 All model 360/30's, 360/30T's,  
 40's, 50's, 60's, 65's, 370's and  
 System 3's. All peripherals and  
 disk reading equipment.

## FOR SALE

 221-1  
 1403N1  
 1401-4 Tapes  
 15K  
 1410-80K  
 25K  
 All Models Unit  
 Record Equipment  
 Longhorn Computer  
 100 North Central  
 Dallas, Texas 75219  
 (214) 522-3170

## BUY SELL SWAP

**24K SUB-MODEL 5**  
**360/20**
**FOR SALE**

360-20  
 2560-20  
 2560-30  
 2560-30 SYSTEM SET  
 120 Processor, 2560 I/O, 350 LPM  
 Read 500 card/min., Punch and Print 500 card/min.  
**CARD LINES**  
 1000 card/min., continuous IBM  
 maintenance, 7% financing avail-  
 able, 36 month lease  
 Contact: W.C. Miller

**WANTED**
 Used disk pack  
 certifiers  
 Used computer  
 tape certifiers  
 CW Box 4227  
 797 Washington St.  
 Newton, Mass.
**WANTED**
 1403-2  
 W/UCS  
 [FIR #8641 & 4740]

 Call or Write:  
 Gene James  
 Overly Mfg. Co.  
 Greensburg, Pa.  
 (412) 834-7300
**ACS****FOR SALE**

65K 1.39  
 MODE 30 SYSTEM  
 COMPUTER SYSTEM SET  
 AND 2311-1  
 W/22023 AND 2360  
 Member Computer Dealers Assoc.

 ACS Equipment Corporation  
 89-28 Spring Branch Drive  
 Houston, TX 77055  
 (713) 481-1333

 For the First Time, American Wholesaler  
 Distributor of Computing  
 IBM 360/30, 360/30T, 360/300  
 360/40, 360/40T, 360/400  
 360/50, 360/50T, 360/500  
 360/60, 360/60T, 360/600  
 360/70, 360/70T, 360/700  
 360/80, 360/80T, 360/800  
 360/90, 360/90T, 360/900  
 360/100, 360/100T, 360/1000  
 360/110, 360/110T, 360/1100  
 360/120, 360/120T, 360/1200  
 360/130, 360/130T, 360/1300  
 360/140, 360/140T, 360/1400  
 360/150, 360/150T, 360/1500  
 360/160, 360/160T, 360/1600  
 360/170, 360/170T, 360/1700  
 360/180, 360/180T, 360/1800  
 360/190, 360/190T, 360/1900  
 360/200, 360/200T, 360/2000  
 360/210, 360/210T, 360/2100  
 360/220, 360/220T, 360/2200  
 360/230, 360/230T, 360/2300  
 360/240, 360/240T, 360/2400  
 360/250, 360/250T, 360/2500  
 360/260, 360/260T, 360/2600  
 360/270, 360/270T, 360/2700  
 360/280, 360/280T, 360/2800  
 360/290, 360/290T, 360/2900  
 360/300, 360/300T, 360/3000  
 360/310, 360/310T, 360/3100  
 360/320, 360/320T, 360/3200  
 360/330, 360/330T, 360/3300  
 360/340, 360/340T, 360/3400  
 360/350, 360/350T, 360/3500  
 360/360, 360/360T, 360/3600  
 360/370, 360/370T, 360/3700  
 360/380, 360/380T, 360/3800  
 360/390, 360/390T, 360/3900  
 360/400, 360/400T, 360/4000  
 360/410, 360/410T, 360/4100  
 360/420, 360/420T, 360/4200  
 360/430, 360/430T, 360/4300  
 360/440, 360/440T, 360/4400  
 360/450, 360/450T, 360/4500  
 360/460, 360/460T, 360/4600  
 360/470, 360/470T, 360/4700  
 360/480, 360/480T, 360/4800  
 360/490, 360/490T, 360/4900  
 360/500, 360/500T, 360/5000  
 360/510, 360/510T, 360/5100  
 360/520, 360/520T, 360/5200  
 360/530, 360/530T, 360/5300  
 360/540, 360/540T, 360/5400  
 360/550, 360/550T, 360/5500  
 360/560, 360/560T, 360/5600  
 360/570, 360/570T, 360/5700  
 360/580, 360/580T, 360/5800  
 360/590, 360/590T, 360/5900  
 360/600, 360/600T, 360/6000  
 360/610, 360/610T, 360/6100  
 360/620, 360/620T, 360/6200  
 360/630, 360/630T, 360/6300  
 360/640, 360/640T, 360/6400  
 360/650, 360/650T, 360/6500  
 360/660, 360/660T, 360/6600  
 360/670, 360/670T, 360/6700  
 360/680, 360/680T, 360/6800  
 360/690, 360/690T, 360/6900  
 360/700, 360/700T, 360/7000  
 360/710, 360/710T, 360/7100  
 360/720, 360/720T, 360/7200  
 360/730, 360/730T, 360/7300  
 360/740, 360/740T, 360/7400  
 360/750, 360/750T, 360/7500  
 360/760, 360/760T, 360/7600  
 360/770, 360/770T, 360/7700  
 360/780, 360/780T, 360/7800  
 360/790, 360/790T, 360/7900  
 360/800, 360/800T, 360/8000  
 360/810, 360/810T, 360/8100  
 360/820, 360/820T, 360/8200  
 360/830, 360/830T, 360/8300  
 360/840, 360/840T, 360/8400  
 360/850, 360/850T, 360/8500  
 360/860, 360/860T, 360/8600  
 360/870, 360/870T, 360/8700  
 360/880, 360/880T, 360/8800  
 360/890, 360/890T, 360/8900  
 360/900, 360/900T, 360/9000  
 360/910, 360/910T, 360/9100  
 360/920, 360/920T, 360/9200  
 360/930, 360/930T, 360/9300  
 360/940, 360/940T, 360/9400  
 360/950, 360/950T, 360/9500  
 360/960, 360/960T, 360/9600  
 360/970, 360/970T, 360/9700  
 360/980, 360/980T, 360/9800  
 360/990, 360/990T, 360/9900  
 360/1000, 360/1000T, 360/10000  
 360/1100, 360/1100T, 360/11000  
 360/1200, 360/1200T, 360/12000  
 360/1300, 360/1300T, 360/13000  
 360/1400, 360/1400T, 360/14000  
 360/1500, 360/1500T, 360/15000  
 360/1600, 360/1600T, 360/16000  
 360/1700, 360/1700T, 360/17000  
 360/1800, 360/1800T, 360/18000  
 360/1900, 360/1900T, 360/19000  
 360/2000, 360/2000T, 360/20000  
 360/2100, 360/2100T, 360/21000  
 360/2200, 360/2200T, 360/22000  
 360/2300, 360/2300T, 360/23000  
 360/2400, 360/2400T, 360/24000  
 360/2500, 360/2500T, 360/25000  
 360/2600, 360/2600T, 360/26000  
 360/2700, 360/2700T, 360/27000  
 360/2800, 360/2800T, 360/28000  
 360/2900, 360/2900T, 360/29000  
 360/3000, 360/3000T, 360/30000  
 360/3100, 360/3100T, 360/31000  
 360/3200, 360/3200T, 360/32000  
 360/3300, 360/3300T, 360/33000  
 360/3400, 360/3400T, 360/34000  
 360/3500, 360/3500T, 360/35000  
 360/3600, 360/3600T, 360/36000  
 360/3700, 360/3700T, 360/37000  
 360/3800, 360/3800T, 360/38000  
 360/3900, 360/3900T, 360/39000  
 360/4000, 360/4000T, 360/40000  
 360/4100, 360/4100T, 360/41000  
 360/4200, 360/4200T, 360/42000  
 360/4300, 360/4300T, 360/43000  
 360/4400, 360/4400T, 360/44000  
 360/4500, 360/4500T, 360/45000  
 360/4600, 360/4600T, 360/46000  
 360/4700, 360/4700T, 360/47000  
 360/4800, 360/4800T, 360/48000  
 360/4900, 360/4900T, 360/49000  
 360/5000, 360/5000T, 360/50000  
 360/5100, 360/5100T, 360/51000  
 360/5200, 360/5200T, 360/52000  
 360/5300, 360/5300T, 360/53000  
 360/5400, 360/5400T, 360/54000  
 360/5500, 360/5500T, 360/55000  
 360/5600, 360/5600T, 360/56000  
 360/5700, 360/5700T, 360/57000  
 360/5800, 360/5800T, 360/58000  
 360/5900, 360/5900T, 360/59000  
 360/6000, 360/6000T, 360/60000  
 360/6100, 360/6100T, 360/61000  
 360/6200, 360/6200T, 360/62000  
 360/6300, 360/6300T, 360/63000  
 360/6400, 360/6400T, 360/64000  
 360/6500, 360/6500T, 360/65000  
 360/6600, 360/6600T, 360/66000  
 360/6700, 360/6700T, 360/67000  
 360/6800, 360/6800T, 360/68000  
 360/6900, 360/6900T, 360/69000  
 360/7000, 360/7000T, 360/70000  
 360/7100, 360/7100T, 360/71000  
 360/7200, 360/7200T, 360/72000  
 360/7300, 360/7300T, 360/73000  
 360/7400, 360/7400T, 360/74000  
 360/7500, 360/7500T, 360/75000  
 360/7600, 360/7600T, 360/76000  
 360/7700, 360/7700T, 360/77000  
 360/7800, 360/7800T, 360/78000  
 360/7900, 360/7900T, 360/79000  
 360/8000, 360/8000T, 360/80000  
 360/8100, 360/8100T, 360/81000  
 360/8200, 360/8200T, 360/82000  
 360/8300, 360/8300T, 360/83000  
 360/8400, 360/8400T, 360/84000  
 360/8500, 360/8500T, 360/85000  
 360/8600, 360/8600T, 360/86000  
 360/8700, 360/8700T, 360/87000  
 360/8800, 360/8800T, 360/88000  
 360/8900, 360/8900T, 360/89000  
 360/9000, 360/9000T, 360/90000  
 360/9100, 360/9100T, 360/91000  
 360/9200, 360/9200T, 360/92000  
 360/9300, 360/9300T, 360/93000  
 360/9400, 360/9400T, 360/94000  
 360/9500, 360/9500T, 360/95000  
 360/9600, 360/9600T, 360/96000  
 360/9700, 360/9700T, 360/97000  
 360/9800, 360/9800T, 360/98000  
 360/9900, 360/9900T, 360/99000  
 360/10000, 360/10000T, 360/100000

## BUY SELL SWAP

**SELL OR LEASE**

IBM 360/40 H

256K CPU

2 Channels, 1052

1403-N1, 2540, 2821-1

IBM 2311 Disk Drives

1401 Systems-\$10,000 &amp; Up

Colcom 2314 Disk Drives

1x2 Double High (4 Spindles)

Computer Sales, Inc.

801 Office Park Plaza

Ottumwa, Iowa 52641

Ottumwa City 348-6861

314/727-7010

713/444-0248

**FOR SALE****OR LEASE**

1401 Disc System

360/30

370/35 Attractive Rates

Corporate Computers, Inc.

115 Main Street

(203) 861-1500

Member Computer Dealers Association

**IBM 360/44 FOR SALE**

Call or Write:

Gene James

Overly Mfg. Co.

Greensburg, Pa.

(412) 834-7300

**FOR SALE BY OWNER**

1 IBM, 360/50 I

2 Selector Channels

1 2314 Mod 1

Available Nov. 3, 1974

Please contact:

J. P. Farnsworth, Inc.

1010 Common Street

P.O. Box 60035

New Orleans, Louisiana 70160

Telephone: (504) 529-4411

Peter Faria or Joe Tusa

**HONEYWELL 200 SYSTEM****SERIES 115 CONSISTING OF**

115-3 Central Processor

4 172 Disk Drives

204-8 Magnetic Tape Units

204-12 Magnetic Tape Units

122-3 Line Printer with soundproofing

214-2 Card Reader/Punch

Available 11-15-74, Contact:

L.M. Vassilas, Comtech U.S.A.

P.O. Box 19097

Houston, Texas 77024

(713) 457-8000

FOR IMMEDIATE LEASE OR PURCHASE

Also available: Accounts Payable &amp; Comtac systems

**FOR SALE****360 Model 40**

AVAILABLE FOR IMMEDIATE LEASE

Any core size, CPU only or complete system including I/O set

For an immediate quote call:

Sid Whiting, Director of Marketing

(201) 569-3838

Diabol Computer Leasing, Inc.

177 N. Penn Street

Englewood, New Jersey 07631

**We Need:****Urgently**

1403-MOD.II

2415-MOD. IV

FOR BETTER VALUE LOOK TO:

CAC

COMPUTER ACQUISITION COMPANY

P.O. Box 80578 Atlanta, Georgia 30325

Member Computer Dealers Association

**FOR SALE****CPU'S, PERIPHERALS, MEMORY****IBM 360****HON 200/2000****UNIVAC 1108-II**

418-II, 1004/5, 9200

MEMOREX 40 &amp; 50

MINIS &amp; PERIPHERALS

(617) 261-1100

AMERICAN USED COMPUTER CORPORATION

P.O. Box 68, Kenmore Square, Boston, MA 02215

Member Computer Dealers Association

EXCELLENT IBM 360/370

PRICE GUARANTEED

QUALITY ASSURED

DEPENDABILITY

VERSATILITY

VERSATILITY

VERSATILITY

VERSATILITY

VERSATILITY

VERSATILITY

VERSATILITY

VERSATILITY

BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP	BUY SELL SWAP
<b>DEAL WITH PROFESSIONAL COMPUTER VENTURE</b> <b>360/370</b> <b>COMPUTER WHOLESALE CORP.</b> <small>Suite 300, 222 North Michigan Avenue, Chicago, IL 60601, 312/501-7741    NEW ORLEANS, LA 70130</small>	<b>3830/3330</b> <b>3830/3330</b> <b>3830/3330</b> <b>Available Now</b> <b>Lease or Purchase</b> <b>Ron Olson</b> <b>CALL: 612-546-4422</b> <b>datawriter</b> <small>equipment inc.    400 South 10th Street, Suite 415    Minneapolis, Minnesota 55426    Member, Computer Dealers Assoc.</small>	<b>360/20</b> <b>Card-Disk-Tape Systems</b> <b>30-80 Day Delivery</b>  <b>ECONOCOM, INC.</b> <small>Subsidiary of ECONOCOM Industries, Inc.    8827 Rock Creek Pike, Bethesda, Maryland 20817    (301) 768-1117    MEMBER COMPUTER DEALERS ASSOCIATION</small>	<b>FOR SALE</b> <b>360/40</b> <b>G to H core</b> <b>128K to 256K</b> <b>Immed. Avail.</b> <b>(212) 673-9300</b> <b>I.O.A. DATA CORP.</b> <small>383 Lafayette St., New York, N.Y. 10003    Member Computer Dealers Assoc.</small>
<b>360/50H \$3500—per mo. short term</b> <b>370/135 take over short term lease</b> <b>370/155 DAT, Accelerator (immediate)</b> <b>1130 CPU &amp; Peripherals—component.</b> <b>can be acquired individually</b>	<b>360/165 2 meg.</b> <b>DICK LANIGAN</b> <b>(212) 953-0050</b>	<b>For sale</b> <b>NCR-315</b> <b>20K slab memory</b> <b>5-334 tape drives</b> <b>1-376-7 cardreader-punch</b> <b>1-376-403 printer</b> <small>Contact DP Manager    P.O. Box 19148    Kansas City, Mo. 64141</small>	<b>Leasing</b> <b>Dynamics Inc.</b> <b>3101 Eastside Ave.,</b> <b>Minneapolis, MN 55416</b> <b>216-857-6100</b>
<b>FOR SALE</b> <b>XEROX COMPUTER EQUIPMENT</b> <small>SDS 910/920 with 16K Core</small>	<b>FOR SALE</b> <b>370/158</b> <b>MODEL K 2 MEG</b> <small>Credit Options    Available to Purchaser    Available to lessee    Call: Mr. Mitchell    (305) 593-3054</small>	<b>FOR SALE</b> <b>360/370</b> <b>BUY-SELL-LEASE</b> <small>Call or Write    George S. McLaughlin    Associates Inc.    480 Morris Avenue    Summit, NJ 07901    (201) 573-5700    Member Computer    Dealers Association</small>	<b>FOR SALE OR LEASE</b> <small>IBM Unit Record Machines    IBM 735/100 Terminals    NCR 31-133, 395-400,    400-405, 400-450    BURROUGHS 1-6 SERIES</small>
<small>IBM 2500 Series    7201/7202 RAD-CTL    7060 Paper Tape Station    8000 Line Printer    7120 and 7130 Card Readers    7440/7445 Line Printers    Signs &amp; 9 Series Modules &amp; Power Supplies    Date Products Modules    CUC 1000 and 1000A    Houston Graph Plotters</small>	<small>1-2 channels &amp; Star,    Protect</small>	<small>54 Kennedy St.,    Hackensack, N.J.    (201) 543-4584</small>	<small>024-3-2-5-0    047-3-2-5-0    050-3-2-5-0    053-3-2-5-0    056-3-2-5-0    059-3-2-5-0    062-3-2-5-0    065-3-2-5-0    068-3-2-5-0    071-3-2-5-0    074-3-2-5-0    077-3-2-5-0    080-3-2-5-0    083-3-2-5-0    086-3-2-5-0    089-3-2-5-0    092-3-2-5-0    095-3-2-5-0    098-3-2-5-0    001-4K-1K-1000    Member Computer    Dealers Association    THOMAS COMPUTER    CORPORATION    Suite 3897-A    5900 North Cicero Court    Chicago, Illinois 60611    (312) 544-1481</small>
<b>WANTED</b> <small>Bryant RAD5-379 Line Printers    Signs Mag Tape Drives    Signs 6's and Signs 7's</small>	<small>I/O EQUIP. for SALE</small>	<small>244 pc. 3' x 3' = 2196 s.f.    including framing, Vinyl sur-    faced alum. plate, Good con-    dition. Write or call:</small>	<small>024-3-2-5-0    047-3-2-5-0    050-3-2-5-0    053-3-2-5-0    056-3-2-5-0    059-3-2-5-0    062-3-2-5-0    065-3-2-5-0    068-3-2-5-0    071-3-2-5-0    074-3-2-5-0    077-3-2-5-0    080-3-2-5-0    083-3-2-5-0    086-3-2-5-0    089-3-2-5-0    092-3-2-5-0    095-3-2-5-0    098-3-2-5-0    001-4K-1K-1000    Member Computer    Dealers Association    THOMAS COMPUTER    CORPORATION    Suite 3897-A    5900 North Cicero Court    Chicago, Illinois 60611    (312) 544-1481</small>
 <small>A Division of TYMSHARE, Inc. 21365 West Agoura Road    Thousand Oaks Village, Calif. 91316    (213) 889-6031</small>	<small>I.O.A. DATA CORP.</small> <small>383 Lafayette St., New York, NY 10003    Member Computer Dealers Assoc.</small>	<small>Baystone Construction, Inc.    P.O. Box 2568    Mayfield, KY    (317) 289-0211</small>	<b>FOR SALE</b> <b>USED COMPUTER FLOORING</b> <small>Call or Write:    Computer Components    Corp.    38-8-8-800    (418) 38-8-800</small>
<b>ITEL is selling:</b> <ul style="list-style-type: none"> <li>• 360/30E</li> <li>• DUPLEX 360/67H w/2365's</li> <li>• 370/155I</li> <li>• 370/155J—SALES OR LEASE</li> </ul>	<ul style="list-style-type: none"> <li>• 155 IBM MEMORY</li> <li>• 155 AMS MEMORY</li> <li>• 2314's (MOD 1's &amp; A1's)</li> <li>• 2816</li> </ul>	<small>244 pc. 3' x 3' = 2196 s.f.    including framing, Vinyl sur-    faced alum. plate, Good con-    dition. Write or call:</small>	<b>FOR SALE</b> <small>Calcomp Equipment:    Model 500 12 inch drum    Model 500 12 inch flat    Model 120 Controller for    Microline 800 system    300 CPM    500 LPM Dataprinter    9.7, 1000 BPI    Parallel, RS 232-C    Gould 9000 Interface;    Remcon Industries    Suite 300, 1000 University St.    12th &amp; First Street    Seattle, Washington 98101    (425) 464-7382</small>
<b>"2314" Sale</b> <small>ITEL is buying 135's, 145's, 155's and 165's.</small>	<b>Call the Computer Sales Corporation at ITEL.</b> <small>In New York, call Dick Absher at (212) 486-9310.    In San Francisco, call Fred Hegeman at (415) 983-0410    or Dick Hynes at (415) 983-0278.    In Dallas, call Tom Brown at (214) 620-2787.</small>	<small>244 pc. 3' x 3' = 2196 s.f.    including framing, Vinyl sur-    faced alum. plate, Good con-    dition. Write or call:</small>	<b>FOR SALE</b> <small>UNIVAC Maintained:    Excellent Pre-Existing    System    PC 30    1000 series, terminals, 41X, Paper    Tape Drives, etc.    For further information contact:    Mr. John J. O'Brien    P.O. Box 2498    Santa Fe, NM 87501    or Call    (505) 852-6536</small>
<b>ITEL</b> <b>CORPORATION</b> <small>One Embarcadero Center, San Francisco, California 94111</small>	<b>SALE-UNIVAC 1005</b> <b>\$18,500.00</b>	<small>244 pc. 3' x 3' = 2196 s.f.    including framing, Vinyl sur-    faced alum. plate, Good con-    dition. Write or call:</small>	<b>FOR SALE</b> <small>UNIVAC EQUIPMENT    All model 380/20's, 360/30's    40's, 50's and 65's, 370's and    System 3's. All peripherals.    1401 SYSTEMS</small>
			<small>Call: Don Norris    Jim Bickie</small>
			<small>DATA AUTOMATION CO. INC.    1000 University Street, Suite 1000    DALLAS, TEXAS 75247    (214) 857-7847    Member Computer Dealers Assoc.</small>

**BUY SELL SWAP**

**360 / 370 BUY SELL SWAP**

We're the one with the finest reputation in the industry for timely delivery of fair market value. We have sold over \$100,000,000 in used IBM COMPUTER EQUIPMENT to individuals, small business and international accounts. We're the largest in the field, and we've built our success on our ability to provide lasting assistance, professionalism, and integrity. Come see us today.

**AVAILABLE EQUIPMENT**

370/155 2 year lease  
370/145 immediately available  
360/50 leases or purchase  
360/50 2 year lease/purchase  
Special on 360/65, 360/80, models 1 & 2  
7 or 9 track  
I/O sets for sale

**Comdisco Inc.**  
Home Office  
2200 E. Devon Ave. Des Plaines, IL 60018  
312/287-3640 TWX-810-232-2478

Eastern Office  
2777 Summer St. Stamford, Conn. 06905  
203/351-4514 TWX-810-232-2478

**comdisco**

**BUY SELL TRADE LEASE**

Montgomery  
Advertisers Association

**don't lease!**

UNTIL YOU FIND OUT WHY LEASING FROM THE FULL-SERVICE COMPANY IS DIFFERENT.

**AVAILABLE IMMEDIATELY:**  
360/40H WITH I/O SET,  
360/50 I WITH I/O SET  
360/75J

CALL STEVE ELIAS AT (213) 678-0311 OR WRITE TO:  
**CSC**  
COMPUTER SCIENCES CORPORATION

**Equipment Delivered Before You Pay**

**pcm**

NOW THERE'S ANOTHER WAY TO GO

**PIONEER COMPUTER MARKETING**

Assets: wholly owned subsidiary of Pioneer Taxicab Corporation, listed on the American Stock Exchange.

**Inventory:** Complete inventory of IBM equipment including systems 370-135-145-155 (see our 370 Ad in this issue), 360/40, 360/50, 360/65, 360/80, 360/100, 360/120, 370/155, 360/200, 360/220, 360/240, 360/260 and all models of tape and disk drives, tape and disk subsystems, and all types of second generation equipment ranging from 029's to 597's.

**Quality:** All our equipment is guaranteed for maintenance contract at your location and competitively reconditioned prior to shipment.

**Size:** National marketing organization and over 1,000 customers. References furnished upon request.

**Stability:** Adequate financial resources for immediate action.

LET US HELP SAVE YOU MONEY IN BUYING AND SELLING EQUIPMENT.

**PCM**

Pioneer Computer Marketing Corporation  
2636 Farrington  
Dallas, Texas 75207  
(214) 637-0950

**1440 SYSTEM FOR SALE OR LEASE**

1441-A6 15K CPU,  
1447-1, 1447-2,  
1446-1, 1403-2,  
1311-1, 1311-2 (Qty 2)  
Avail. 11/1/74

Contact: BOB JOHNSON  
Call: 614-546-4422

**dataverv**

equipment inc.  
400 Sheldan Plaza, Suite #15  
Minneapolis, Minnesota 55421  
Member, Computer Dealers Assoc.

**FOR SALE**

IBM 1403 Printer  
IBM 1402-1401  
IBM 1406-1620-40K  
Unit Record all Models  
Wanted  
System 3, all models  
029, 083, 557

**ARVCO COMPUTER**  
617-987-0185

**BAY AREA COMPUTER CORPORATION**

61 Avenue de Orinda  
Orinda, Calif. 94563  
**(415) 254-3976**  
G.T. Olson  
**BUY • SELL  
LEASE • TRADE**  
**IBM 360/370**  
IBM Computer Equipment  
Specialists in the West

**1401**

DISK SYSTEM

1401 Disk System  
1401 Disk Subsystem  
1401 Disk Controller  
1401 Disk Drive  
1401 Disk Subsystem  
1401 Disk Controller  
1401 Disk Drive  
1401 Disk Subsystem  
1401 Disk Controller  
1401 Disk Drive

**370/155 512K AMS MEMORY**

4, 1 x 8 disk storage subsystems  
(IBM 3330 compatible)

Available Immediately  
(Principals only)  
Contact: R. Silver  
Present User  
(213) 246-9456

**1440 SYSTEM FOR SALE OR LEASE**

1441-A6 15K CPU,  
1447-1, 1447-2,  
1446-1, 1403-2,  
1311-1, 1311-2 (Qty 2)  
Avail. 11/1/74

Contact: BOB JOHNSON  
Call: 614-546-4422

**dataverv**

equipment inc.  
400 Sheldan Plaza, Suite #15  
Minneapolis, Minnesota 55421  
Member, Computer Dealers Assoc.

**SYSTEM 3/ OWNERS**

Is your System/3 going to be available for sale within the next 9 months? If so, Econocom, Inc. wants to buy it from you today. Contact me with the details on your System's status. Call collect or write to:

Subsidiary of Cook Industries, Inc.  
P.O. Box 771116  
855 Ridge Lake Boulevard  
Memphis, Tennessee 38117  
Telephone (901) 767-9130

JOHN E. GOODMAN  
Director of Purchasing

**ECONOCOM, INC.**

**ALWAYS UP & RUNNING  
LEASING, BUYING, SELLING**

**WANTED**  
1419's  
2040G  
Computer single & dual density drives

**SALE OR LEASE**  
2300 with 1 U set  
CDC 6600 system  
complete with I/O and disk

**BOOTH** • Don Bell • 989 6580

**AVAILABLE IMMEDIATELY**

**IBM 360/20 D02, Ser. No. 22069**

with:  
1550  
8083  
7495  
8099  
4658

**2203/A1,**  
with 5558  
**2560/A1,**  
with 1575  
**2311/11,**  
2311/11, 17966  
**2415/5,**  
under full IBM-maintenance  
selling: US-\$ 88,510,- fob New York

**IBM 360/40 G00 128K, Ser. No. 22054**

with:  
7920  
6980  
6981  
3237  
4427  
7520

**1052/7,**  
under full IBM-maintenance  
selling: US-\$ 79,890,- fob New York

Pls. contact Mr. Gerd Peffgen  
**PROMODATA GMBH**  
Mannheimer Str. 97  
GERMANY  
Tel: 0611-238189  
Telex: 0413461

**-SALE- 360/65 -LEASE-**

**SYSTEMS AVAILABLE**

1401  
360/20  
360/30  
360/50  
370/155

**ECONOCOM, INC.**  
Subsidiary of Cook Industries Inc.  
855 Ridge Lake Blvd.  
P.O. Box 77116  
Memphis, Tennessee 38117  
(901) 767-9130

**I/O AVAILABLE**

2300-16  
2401-6's  
2501-82  
2520-82  
I/O Sets

**"MEMBER COMPUTER DEALERS ASSOCIATION"**





# IBM 370's

are leased to save money.

CSA leases provide long term economy, while customers enjoy the flexibility of upgrading and early termination.

For further information, please call (817) 822-4671.

**Computer Systems  
of America, Inc.**

a computer equipment leasing company

141 Main St., Boston, Mass. 02128

Send us the 12 questions you should ask of any leasing company before you lease.

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip _____
370 on order <input type="checkbox"/> installed <input checked="" type="checkbox"/>
Model _____ Due Date _____

## Acquisitions

The merger of Comres, Inc., developer of software programs and hardware monitoring equipment, into Comten, Inc., a communications firm, has been completed. Revenues from former Comres operations will be included in Comten revenues only for the fourth quarter.

Final agreement has been reached for the acquisition by Tymshare, Inc., of Union Data Corp., Inc. (UDC), subject to ratification by UDC shareholders. Terms call for the exchange of about 650,000 shares of Tymshare common on the basis of 45 of a share of Tymshare common for each outstanding share of UDC common.

Recognition Equipment, Inc. has agreed in principle to change the terms announced in 1972 under which it would acquire Corporation S.

The new agreement calls for a cash acquisition of the common stock of Corporation S, which operates service centers for document processing systems made by Recognition Equipment.

Documentation, Inc. has acquired Advanced Board Circuits, which will continue to market its products on an OEM basis.

### \* WANTED \*

Firms to: Buy  360 & 370  
Sell  Lease  Systems and I/O  
Sub-Lease

Write or Call Collect — Today  
Its our only business

**NVC**

**COMPUTER SALES, INC.**

Suite 616, Benjamin Fox Pavilion  
Jenkintown, Pa. 19046 • (215) 887-5404  
Computer Components • Assembly

## LEASE OR SALE CDC 6600 AVAILABLE DECEMBER 1974

- 65.5 WORDS STORAGE
- (2) 6638 DISC SYSTEMS
- CARD READER & PUNCH
- LINE PRINTER

BOOTHE COMPUTER - DON BELL - (415) 989-6580

Gentlemen: Have you planned ahead?

How would you like to purchase a NEW SYSTEM 370/158 or 168 for 60% of IBM Purchase Price!

or

Take a 6-year "Walk-Away"  
Lease for 60% of IBM M.A.C.!

## COMPUTERWORLD

### \$7 Million Loss

## Charge Sinks CDC's Third Period

MINNEAPOLIS — Control Data Corp. showed a third-quarter loss of \$7.3 million or 46 cents a share, a major charge arising from the Union Bank of Switzerland's decision to seek to discontinue a joint development project.

For the year-to-date period, CDC earned \$1.3 million or 81 cents a share.

CDC is effecting cost reduction programs in its computer operations to offset the effects of inflation and high interest rates.

Third-quarter earnings from the computer operations sector rose 23% to \$28.2 million from \$23.1 million last year. The computer sector lost \$14.2 million in the year-to-date earnings of \$3.3 million last year.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit Co., CDC's financial services subsidiary, was affected by higher average interest rates which eroded loan and leasing profit margins, the firm said.

Commercial Credit's gross income rose to \$170.7 million in the third quarter, but net earnings dropped to \$7.2 million from \$10 million. However, earnings were improved over the earlier quarters of this year, the firm noted.

### 9 Months Drag

The charge dragged CDC's consolidated nine-month earnings down 56% to \$19.7 million or \$1.17 a share compared with \$45.7 million or \$2.80 a share in the same period last year.

Earnings for the nine months rose 22% to nearly \$81.8 million from \$67.03 million a year ago.

Computer operations showed a loss of \$6.7 million compared with a profit of \$1.8 million in the nine months of 1973. Commercial Credit's earnings were off last year's pace at \$26.4 million compared with \$33.5 million.

Efforts are underway to arrive at acceptable terms of a settle-

ment with the Union Bank, Chairman William Norris said. The bank had sought to recoup manufacturers costs, equipment purchases, special hardware, software and support costs incurred over the past three years under the Union Bank contract, Norris said. He also provides for costs and expenses associated with the cessation of the project, the firm said.

However, the ultimate financial impact will be determined by the eventual resolution of this matter, he added.

CDC is taking several steps to reduce expenses, Norris noted. While computer business orders and revenues continue to exceed budgets, inflation and high interest rates have continued to squeeze profit margins, he explained.

CDC is shelving some technical programs and stretching out others, cutting controllable expenses and effecting small reductions in the overall work force.

## NCR Posts Record Nine Month Figures

DAYTON, Ohio — NCR Corp. showed record results for the third quarter and nine months with third-quarter earnings rising 21% on an 11% increase in revenues.

Earnings reached \$19.9 million on 414 units, a share compared with \$16.5 million or 70 cents a share in the year-ago period.

Revenues totaled \$488.1 million compared with \$436 million in the same period last year.

Nine-month earnings rose 39% to \$51.8 million or \$2.13 a share compared with \$37.3 million or \$1.60 a share last year.

Revenues for the nine months total \$14.1 million, a 9% rise over \$12.1 million in the year-ago period.

U.S. earnings benefited from improved margins on newer products and reduced marketing expenses resulting from the reorganization of marketing activities effected Jan. 1, said President William S. Anderson.

However, earnings from outside the U.S. were adversely impacted by a 10% decline in output from its factory in Fife, Scotland, which the company said reflected component shortages and the UK's energy crisis earlier this year.

In addition, foreign currency exchange adjustments of about \$5 million adversely affected third-quarter earnings.

he does not expect "any appreciable earnings increase in the fourth quarter of this year as compared with last year's fourth quarter," since the 1973 fourth quarter results were "favorably impacted" by sizable market-share increases in 1973 and by an exceptionally heavy volume of equipment deliveries during that quarter."

### 12 FOR THE PRICE OF 13!

Is that your kind of deal?

Suppose your bank called your and asked for an additional mortgage check for year! That's what the new 8% hike in IBM rates means to your data processing budget. If you'd like to put some of those checks back into the cash flow of your company or finance a new application, consider the sensible alternative . . . System 360.

Write or call for our Fall Newsletter.

**Inflation Beaters Available** **We Seek to Purchase**  
IBM 360/65, 360/50, 360/30 IBM 360/40  
IBM 260-2 Selectio Channel IBM 370/All Models  
IBM 280/230/ Drum Storage IBM 2821/2540/1403  
UNIVAC 1108 & 9000 Series IBM 3803/3420 Tape

**NATIONAL COMPUTER RENTAL, LTD.**

Member Tiger Leasing Group

415 Madison Avenue, New York, N.Y. 10017

Tel: (212) 532-1500

Member Computer Lessors Association Telex: 12333

**CIS**

MIDTOWN PLAZA  
700 EAST 42nd STREET  
SYRACUSE, NEW YORK 13210

GENERAL MANAGER

CIS BUSINESS SALES

60 CHAMBERS ST. CHICAGO IL 60611

PHONE: (312) 36 99 93

TELEX 29025 BUREO B





## If you only need a computer for 3 years, you shouldn't have to settle for more.

If your company isn't quite ready for a long term computer relationship, look into ITEL's short term IBM 370 system lease.

It's a two- or three-year packaged operating lease that lets you keep your freedom and conserve capital at the same time.

For example, ITEL will lease you an IBM 370 central processing unit, plus ITEL's 7330 disk subsystem and ITEL memory at up to 40% savings over IBM's rental on an equivalent system.

Who's behind this good news?

The people who pioneered IBM 370 financial packaged leases. The same people who have over half a billion dollars in IBM computer leasing experience.

**Your financial alternative.** ITEL CORPORATION  
DATA PRODUCTS GROUP

One Embarcadero Center, San Francisco, California 94111. Phone: (415) 983-0000